



COLONY OF MAURITIUS

Annual Report of the
Department of Agriculture
for 1936.

[Price 75 cents]

PRINTED AND PUBLISHED BY
R. W. BROOKS, GOVERNMENT PRINTER,
PORT LOUIS, MAURITIUS.
1937



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A. MOUTIA,

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RAINFALL MAP

FOR THE AVERAGE

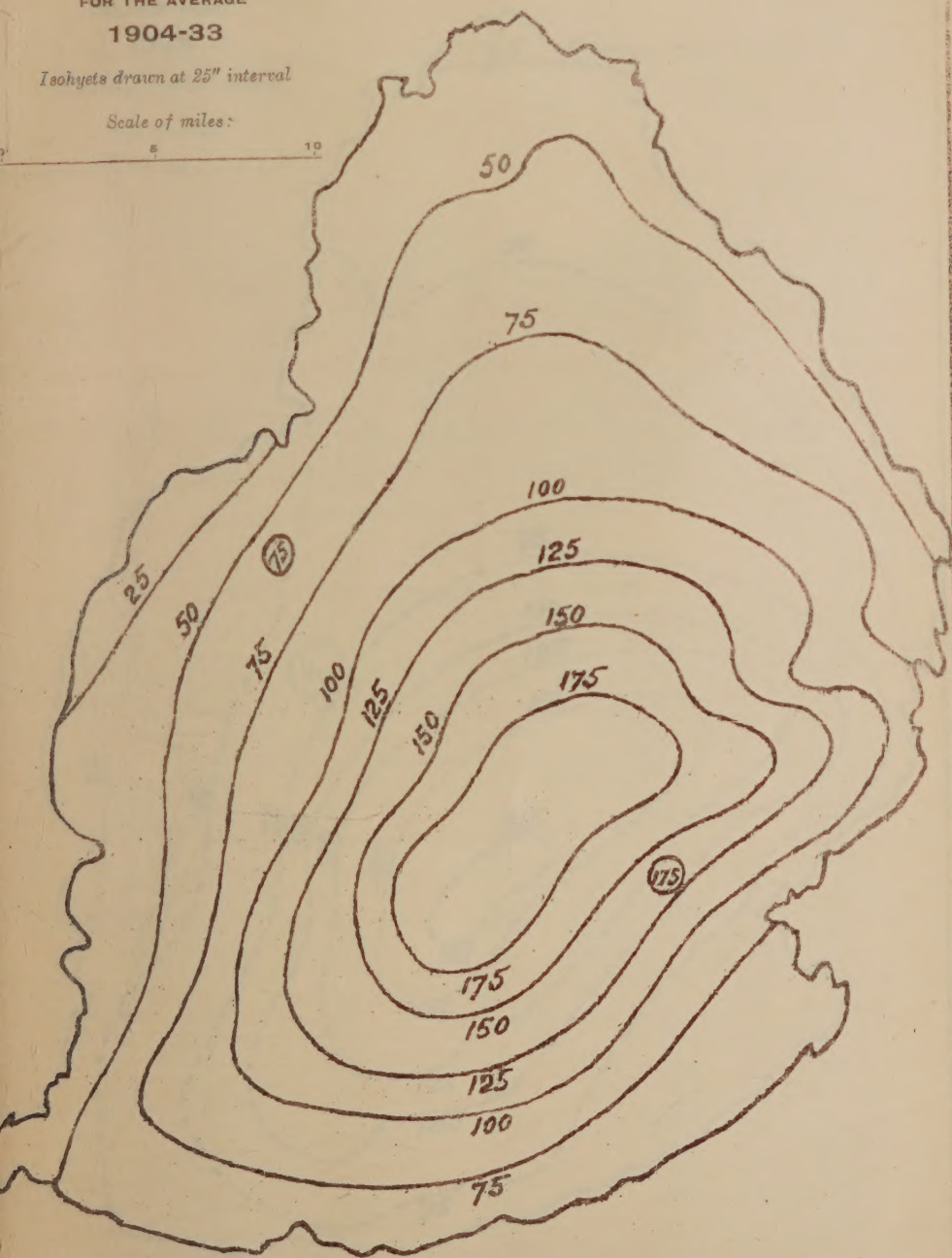
1904-33

Isohyets drawn at 25" interval

Scale of miles:

5

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RAINFALL MAP

FOR THE YEAR

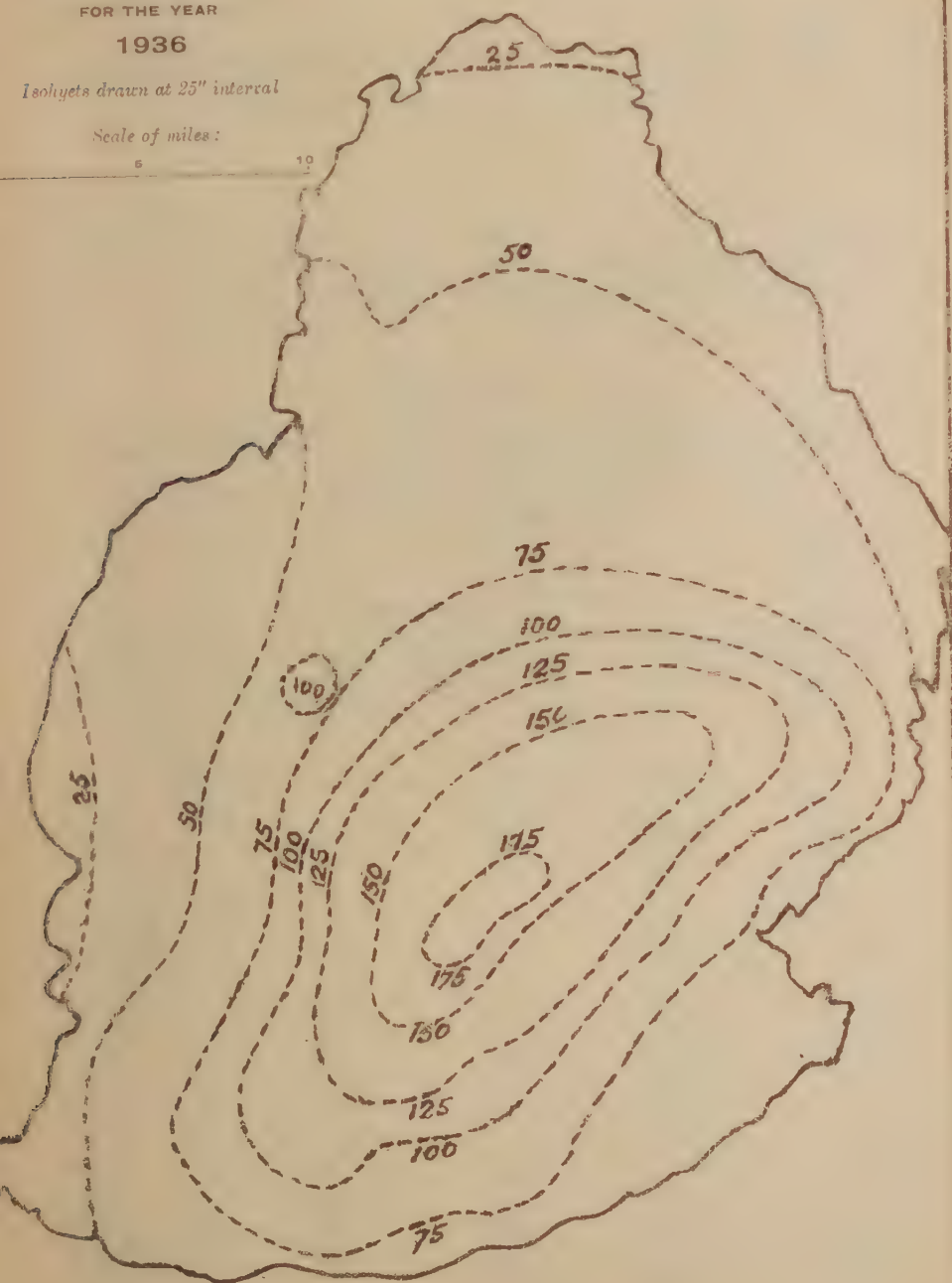
1936

Isoliets drawn at 25" interval

Scale of miles:

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10



ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE FOR 1936.

No. 217/36.

THE HONOURABLE THE COLONIAL SECRETARY,

I have the honour to submit the report on the Agricultural conditions of the Colony and the work of the Department of Agriculture for the year 1936.

PART I.

General Report on the Agricultural Conditions of the Colony and the work of the Department of Agriculture during 1936.

1.—Meteorological Conditions.

The following figures indicate the temperature and rainfall conditions which prevailed at the Central Experiment Station, Réduit. More extensive information in this respect is given in the Appendix, together with a rainfall chart for the whole Island.

TABLE I.
Station : Department of Agriculture, Réduit.

Months and Years	Air Temperature °C		Departure from normal °C		Rainfall mm.	Departure from normal %	
1935							
November	...	22.1	...	+0.4	...	214.1	... + 307
December	...	23.6	...	+0.2	...	207.1	... + 51
1936							
January	...	24.3	...	+0.2	...	282.3	... + 7
February	...	24.6	...	+0.3	...	159.7	... - 43
March	...	24.2	...	+0.5	...	117.4	... - 61
April	...	22.4	...	-0.2	...	46.0	... - 67
May	...	20.1	...	-0.4	...	61.2	... - 43
June	...	18.5	...	-0.1	...	71.8	... - 9
July	...	17.7	...	-0.1	...	48.2	... - 31
August	...	17.0	...	-0.8	...	21.6	... - 66
September	...	18.3	...	-0.3	...	49.0	... + 13
October	...	20.6	...	+0.8	...	112.1	... + 131
November	...	22.4	...	+0.6	...	41.8	... - 29
December	...	23.3	...	-0.1	...	283.5	... + 75

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As will be seen from the above table which affords a good index for the average of the Island weather conditions were fairly satisfactory except in the northern districts, where a drought was in evidence from March till August. Nothing in the incidence of weather factors justified an expectation of the highest sugar production so far recorded in the Colony.

2.—Sugar Production.

The total cane reaped approximated 2,547 thousand tons, in excess by 45 thousand tons on last year's production, then considered exceptionally high. The sucrose content of the cane surpassed all expectations, averaging 13.71, as compared with 13.14 in 1935 and 12.86 in 1934. The average extraction for the whole Colony reached 11.79, as against a previous maximum of 11.25 in 1933. As a result of the association of these two favourable factors the output of sugar reached the record total of 300.34 thousand metric tons.

The following table exhibits the comparative production for the past seven years:

TABLE II.

Yields of Sugar in thousand metric tons

	1936	1935	1934	1933	1932	1931	1930
Pamplemousses							
and R. du Rempt.	63.97	69.97	30.13	57.77	62.73	41.81	43.00
Flacq ...	49.98	44.15	30.87	41.87	35.97	27.91	37.81
Moka ...	43.42	35.76	29.30	40.08	34.12	20.83	32.10
Plaines Wilhems	21.89	20.62	11.54	18.22	17.05	11.64	14.62
Black River ...	12.85	11.28	5.99	8.88	9.06	6.29	9.81
Grand Port ...	56.10	53.38	38.37	50.66	46.66	28.52	46.53
Savanne ...	52.13	45.34	32.66	44.48	41.63	27.01	37.09
Total ...	300.34	280.50	178.86	261.46	247.22	164.01	220.96

The figures for 1931 evinces a reduction, estimated at 34% due to a severe cyclone. In 1934 there was a severe drought.

The large output for 1936 is probably the result of a number of different factors operating in the same direction: the high sucrose content, responsible for 12 to 15 thousand tons of sugar extra, is probably due in part to the cool and sunny weather which obtained during the ripening season and in part to a higher percentage of sweet canes reaped (BH.10/12). The heavy yields obtained in the Central and Southern districts appear to result from (a) the increase in the area cultivated; (b) improved cane varieties; (c) superior cultivation and fertilization; (d) enhanced irrigation; (e) total absence of cyclones, the whole associated with an excellent start of the crop made in November and December. (See Table I).

3.—Grades of Sugar.

The proportion of Raws was, this year, 77.85% of the total sugar production; Vesous were 21.68%; while Low Sugars approximated to 0.47%. The change brought about by the introduction of the New English Tariff in 1928 is illustrated in the following table:

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TABLE III.

Years		Vesous %		Raws %		Lows %
1925	...	98.21	...	—	...	1.79
1926	...	98.10	...	—	...	1.90
1927	...	98.63	...	—	...	1.37
1928	...	71.80	...	27.30	...	0.90
1929	...	23.90	...	75.20	...	0.90
1930	...	16.80	...	82.50	...	0.70
1931	...	16.20	...	83.10	...	0.70
1932	...	12.10	...	87.50	...	0.40
1933	...	11.80	...	87.70	...	0.50
1934	...	20.56	...	78.76	...	0.68
1935	...	12.60	...	87.10	...	0.30
1936	...	21.68	...	77.85	...	0.47

4.—Area under Sugarcane

At the beginning of 1936 the area under cane was estimated at 139,341 acres, in excess by 1,032 acres on the corresponding figure for the year previous. Estates with factory cultivated 59,914 acres, estates without factory, 37,697, giving a total estate cultivation of 97,611. The balance of 41,730 acres was cultivated by smaller planters, mostly Indian peasant proprietors. At the end of 1936 the area under cane was 143,497, or in excess by 4,156 acres on the figure for the year previous. Of these the increase in estate cultivation totalled 3,456 acres.

5.—Number of Sugar Factories.

The tendency towards centralization has been manifested very clearly during recent years. In 1936 two factories were closed down leaving, for that year, a total of 40 in operation. The dismantling of two more has been decided on so that, in 1937 only 38 factories will operate. They numbered 54 in 1921.

6.—Varieties of Cane.

To gauge the influence on the total sugar production of the marked increase which has taken place in the cultivation of BH.10 '12, and the extent to which it has displaced the standard Tanna, an inquiry was conducted at the end of the year, concerning the relative amount of this variety on estates. The results are as follows:

Districts	Total % of cane
Pamplemousses and R. du Rempart	... 32
Flacq	... 31
Moka	... 8
Plaines Wilhems	... 22
Black River	... 37
Grand Port	... 21
Savanne	... 29
Whole Island	... 26

It would thus appear that over a quarter of the total estate cultivation, or approximately 26 thousand acres are, at present, under BH.10 '12.

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As the richness of BH.10/12 markedly exceeds that of Tannas while, with favourable weather, the yield in the field of the first variety is generally in excess of that of the second, it would seem that within the next few years the Colony's output in sugar may be appreciably increased owing to the extension given to BH.10/12.

7.—Sugar Market.

The market for sugar remained debased throughout the greater part of the year. Towards the middle of December quotations improved. By December 31st the whole production had been disposed of at an average price approximating to Rs. 5.50 net per kilos, on a basis of 99 polarization, including the benefit of extra colonial preference. The net price per 50 kilos realized for the 1935 crop was Rs. 5.69.

8.—Disposal of the 1935-36 Crop and Local Sugar Consumption.

The total quantity of sugar exported during the 1935-36 year (August 1st, 1935, to July 31st, 1936) amounted to 273,898.6 metric tons, distributed as follows:

		Tons
Great Britain	...	241,776.6
Canada	...	31,531.3
Hong Kong	...	355.6
Other Places	...	235.1
		273,898.6

The exportation for the 1936-37 crop, up to the end of December, 1936, was as follows:

		Tons
Great Britain	...	116,907.0
Canada	...	16,529.8
Other Places	...	114.9
		133,551.7

The local consumption of sugar for the 1935-36 year was 9,327 metric tons, as compared with 11,211 for the year previous, and 10,381 for 1933-34.

9.—Labour and Cost of Living.

Owing to the exceptionally heavy crop reaped there was especially in the Southern districts, occasional dearth of labour. Unemployment among the agricultural labouring classes was not much in evidence during the year.

The cost of living in some respects was below pre-war standard. Thus, in 1936 grains were, on the average, indexed at 70 ; flour, at 77 ; oils and fats, at 75 ; and meat (fresh or salt) at 99. The pre-war index being 100.

10.—Sugar Machinery.

Machinery to the value of Rs. 589,449 was imported during the year, as against Rs. 438,588 in 1935. Tramway material to the value of Rs. 328,219 was imported, as compared with Rs. 194,666 the year previous.

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11.—Fertilisers.

The importation of chemical fertilisers in 1936 totalled 21,588,262 kilos, valued at Rs. 2,078,332, as compared with 15,589,852 kilos in 1935, valued at Rs. 1,754,425.

12.—Insect Pests.

The outstanding events of 1936 have been the completion of the tour of the Phytalus Investigation Officer in Java and the middle East in connection with Phytalus parasites ; the appointment of the Phytalus Investigation Officer as Entomologist in this Department ; a further mission to Madagascar in connection with a special dipterous parasite of Phytalus ; the cessation of hand collection of Phytalus, on an experimental scale, on a number of centres ; the abolition of legal measures connected with the transport of Phytalus in farmyard manure ; and the added prominence of sugarcane borers.

The activities of the Phytalus Investigation Officer in Java and elsewhere have resulted in the introduction and successful establishment of a further number of hymenopterous parasites of Phytalus. Mr. Jepson has written a comprehensive report on his mission and advocates, as the future main line attack against this pest, the continued search and introduction of numerous and varied enemies of this beetle pest. The appointment of this officer to the post of Entomologist in the Department not only establishes a continuation of the Phytalus work begun during his employment as Phytalus Investigation Officer, but brings up to strength an important division of this department.

Mr. Régnard, the 2nd Phytalus Officer, conducted the mission in Madagascar. A large number of Tachinid flies were sent over to Mauritius and some hope may be entertained that this parasite will establish itself.

The cessation of Phytalus collection is an interesting experiment. Based on the recommendations of the Assistant Entomologist and the Phytalus Investigation Officer, the Phytalus Advisory Board decided to embark on such an enterprise. No less than 33% of the interested centres have thus ceased to collect. The situation is being most carefully watched.

For many years the movements of manure from one district to another have been encompassed about by a number of regulations aimed at reducing the possibilities of the spread of Phytalus by such transport. The administration of such legal measures has not proved simple, and the acceptance by the Phytalus Advisory Board of the combined advice of Messrs. Jepson and Moutia in connection with the cancelling of such legal measures was most welcome.

The Borer situation in a greater or lesser degree is always present in the Island. At present it is far too prominent, and a proposal is afoot to secure a further range of parasites from other parts of the world.

13.—Plant Diseases.

A new policy for testing gumming resistance in seedling canes evolved by the Sugarcane Research Station will be adopted in future ; other diseases of this plant received the usual careful attention. There was a continuance of the study of tobacco diseases and their status, throughout the Island, with the added assistance of Tobacco Inspectors, was closely watched. Black Shank again gave some trouble as well as Mosaic. A peculiar leaf-curl

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affliction was observed in one instance, but a study thereof indicated that it was not a new virus disease. A number of other diseases of economic importance received attention.

A good deal of attention was given to ensilage: experiments show that there is much to be learnt of this process under local conditions.

14.—Tobacco Industry.

During the year under review the Tobacco Board issued certificates for the cultivation of 700 acres, as compared with 404 acres for the previous year. Purchase prices for leaf tobacco were also increased by 20% and a re-organisation of grades effected.

The acreage registered was not fully planted and the actual area taken up was 661½ acres, as compared with 394½ acres in the previous year.

The division of the acreage is shown in the following table and compared with the previous year.

Type	No. of Growers			Area planted		
		1935	1936	1935	1936	
Flue Cured	...	53	56	...	286½	510½
Air Cured	...	255	280	...	108	150¾
		308	336	...	394½	661¼

The crop was limited to 350,000 kilos or a quota of 500 kilos per acre, any surplus to be destroyed. The quota, however, was repealed towards the middle of the crop owing to the poor prospects in yield at that time.

Conditions were not favourable during the early part of the crop, but good rains, which started towards the middle of September, had a beneficial effect on all plantations: as a result the yield and the quality of the leaf improved beyond expectations.

The amount of leaf purchased by the Warehouse during 1936 was 375,923 kilos, of a value of Rs. 475,325.83, as compared with 275,710 kilos of a value of Rs. 268,321.29, in the previous year..

The present method of selling leaf by contract to manufacturers continued to work in a satisfactory manner.

The amount of leaf used by manufacturers was 321,544 kilos, as compared with 300,148 kilos in the previous year.

The Tobacco Board forwarded a trial shipment of 1,147 kilos of the four best grades of leaf to a London firm of brokers early in the year with a view to testing further the possibilities of finding an export market. The leaf was sold at an average price of 1 3d per lb, but reports received later in the year indicated that the question of flavour was still difficult, and in view of this no further supplies were sent.

Samples of new varieties were forwarded to London for manufacturers' opinion. The reports received were, on the whole, unfavourable, and indicate that further experiments will have to be carried out for the production of leaf with a more acceptable flavour.

The Tobacco Breeding Officer left for England towards the end of the year on the termination of his three years' agreement with the Tobacco Board.

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15.—Alœ Fibre.

Conditions in 1936 were somewhat better. The total export of fibre was 1213.8 metric tons, as against 446 in 1935. Consideration is being given to the best means of furthering the interests of the fibre industry, and in particular to the possibility of re-opening the bag factory.

16.—Pineapple Industry.

Prospects are somewhat better as regards this industry. The Colonial Development Fund has sanctioned an advance of £2,000 to growers and a committee has been appointed for the control of the fund. The movement having just been initiated, it is not yet possible to gauge the extent of its success. The same fund has donated £1,000 for experiments in pineapple cultivation by the Department of Agriculture. Three areas are to be utilized for this purpose in representative parts of the Island.

During the 1935-36 year the Canning Factory turned out 2,900 cases of canned fruit, of a net total weight of 66,000 kilos. Figures for previous years are as follows:

Years	Cases
1931-32	4,224
1932-33	4,982
1933-34	2,300
1934-35	2,188

17.—Tea Industry.

Progress is being maintained in this industry. The production at Canepe (Corson) tea garden for the year 1936 was 6,500 kilos. Figures for previous years are as follows:

Years	Kilos
1931	8,713
1932	8,688½
1933	12,251½
1934	13,425½
1935	12,600

At Bois Chéri Estate, the yield has been 21,750 kilos for 1935-36. For previous years the figures were:

Years	Kilos
1932-33	9,500
1933-34	10,000
1934-35	27,880½

18.—Coconut Industry.

The export of copra—produce of the Dependencies of Mauritius—amounted during the year to 1,331.5 tons, valued at Rs. 229,884, as against 1,746 tons, valued at Rs. 217,985, in 1935. The export of coconut oil during the year was 7,113 litres, valued at Rs. 2,686, as compared with 2,652 litres, valued at Rs. 906, in 1935.

19.—Alcohol.

The total quantity of alcohol distilled for human consumption amounted to 651,727 litres, as against 539,361 litres the year previous. The quantity distilled for industrial purposes was 483,820 litres, as against 360,670 litres

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in 1935. The exportation of rum during the year was 39,619 litres, valued at Rs. 8,776, as against 18,155 litres, valued at Rs. 5,299, in 1935.

20.—Veterinary and Livestock.

At the beginning of 1936 the horned cattle on estates totalled 14,195, as compared with 11,615 at the beginning of 1935. The number of sheep on estates was 1961, as against 1567 for the year previous. Cattle importation from Madagascar and other places amounted to 5,767 heads, valued at Rs. 362,000, of which 5,766 heads for beef and 1 head for other purposes.

During the year Professor R. Lindsay Robb, of Pretoria University, visited Mauritius and undertook a study of the possibilities of beef development. His report has been received and it contains the opinion that there exist here considerable possibilities of breeding for meat production. The details of the application of the scheme are under discussion between Government and the Stock Breeders' Association.

21.—Co-operative Credit Societies.

Improvement has been well maintained. The experience gained by the Assistant Registrar during his official visit to Ceylon has enabled him, on his return to Mauritius, to promulgate a number of recommendations for the better organisation of the movement.

Not only was the amount that Societies disbursed as loans to their members higher than in the previous year, but of the total of such loans issued and recovered during the period under review only 2.6% has fallen into arrear. This is an exceedingly healthy sign and forms a new record of efficiency in this particular respect.

Yet another sign of the increased vitality of co-operative credit in Mauritius is the formation of a number of new Societies.

22.—Rodrigues.

I visited this Dependency in August, in company with the Senior Agricultural Officer, and spent a fortnight in making a close examination of local agricultural conditions. My deliberations and conclusions have been embodied in a report to Government.

The active agricultural policy which I have advocated contains definite recommendations concerning the examination of irrigation possibilities; the development of coconut, tobacco, livestock and pasturage; the re-institution of an adequate prize-holding scheme; and continuation of anti-soil erosion measures; proper handling of co-operative credit and marketing schemes have also received full attention. I trust that as time goes on such a policy will enable the community of Rodrigues—which is entirely agriculture—to attain a better degree of livelihood than is at present the case.

23.—General.

I wish to record my deep appreciation of the measure of assistance which I have unhesitating been accorded by the staff of the Department during the year.

G. E. BODKIN,
Director of Agriculture.

Réduit,
April 7th, 1937.

DEPARTMENT OF AGRICULTURE

PART II.

Report on the Sugarcane Research Station and Divisional Reports of the Department of Agriculture.

A full report of the activities of the Sugarcane Research Station for 1936 is published, as usual, in the form of a separate report; short extracts from the report of each Research Officer only being given here.

A.—GENETICIST'S DIVISION.

1.—General.

The year was notable for the great promise shown by the newly released clone M.171/30, which outyielded its controls in field trials, on the average, by 26%. This excellent clone, bred from RP.6 × M.27/16, has already been given out to about fifty centres and by next season should be distributed throughout the Island.

During recent years the variety BH.10(12), introduced in 1920, but occupying only 7% of the cane area in 1933, has sprung into considerable prominence, especially in the warmer districts, so that should it continue to spread at its present rapid rate the cane breeders' problem may soon be to find a successor, not for White Tanna, but for this variety. In the writer's opinion this will be found possible, judging by the performance of new clones like M.171/30, M.72/31, M.73/31 and M.134/32, when tested against BH.10(12), which is now being used as the control variety in most yield trials.

2.—Crossing Programme, 1936.

This was based on a careful analysis of the parents used during the past six years and resulted in the elimination of many unproductive crosses.

In all 208 crosses were carried out, of which eight were made for despatch to the Director of Plant Breeding, New South Wales. The total number of seedlings raised in boxes was 38,000, of which 27,000 were bred by the open method, 7,000 by the bag method, and 4,000 by the lantern method.

It is possible that at some future date almost all breeding work will be carried out in the uplands at Réduit, because there are distinct indications that the number of selected clones in any batch of 1st year seedlings is higher amongst those bred in the uplands than in seedlings of the same parentage bred in the lowlands at Pamplemousses.

1st Trial Seedlings.—By the end of December all potted seedlings had been transplanted into the field, 10,800 at Réduit and 7,700 at Pamplemousses. A considerable number of seedlings of the cross RP.6 × M.27/16 were planted out at each station, as this combination had given excellent results in the past.

During the crop period 185 selections, representing 1.2% of the total, were made from the 1st year population of 14,700 raised in 1935.

2nd Trial Seedlings.—Seven 2nd trials containing 68 clones were laid down during the year, and 14 trials containing 146 clones harvested, from which 22 selections, or 15%, were retained for 3rd trials.

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2nd Trial Seedlings—Five of these trials, containing 23 selections, were laid down and 22 harvested. From these, 26 clones were retained for field trials, no clone being selected unless it had outyielded the control variety, usually BH.10(12) and was satisfactory in other respects. Amongst the most promising of these clones are: M.65/31, M.127/32, M.130/32, and M.134/32, all of which are 4th nobilised glagah types.

In addition to yield and disease resistance trials, the following additional information was, for the first time, determined in the case of the most promising clones in 3rd trials:

- (a) Defecation quality of juice ;
- (b) Percentage of internodes attacked by cane borers ;
- (c) Percentage of fibre in cane.

3.—Field Trial Selections.

Apart from the Mauritius seedlings M.108/30, M.171/30, and M.73/31, the most successful varieties in the trials cut during the crop were: BH.10(12), POJ.2727, POJ.2878, and Selangor Seedling.

In the last annual report reference was made to the fact that the most promising varieties bred to date had been distributed to over thirty centres for multiplication. As a result eight co-operative yield trials have already been laid down with these varieties on representative estates, while in other cases these canes are being tested in trials conducted by the estates themselves.

4.—Released Varieties.

The following new varieties were released for general distribution during the year on the recommendation of a committee consisting of the writer, the Mycologist, the Senior Agricultural Officer, and the Assistant Entomologist: M.171/30, M.72/31, and M.73/31.

5.—Phytalus Resistant Varieties.

The clone M.108/30 released for general distribution in 1935 and recommended for planting in *Phytalus* infested areas, has lived up to its early promise.

So far the only really successful combination yielding clones suitable for *Phytalus* lands is POJ.2878 × Uba Marot, a cross that produces seedlings which, unfortunately, almost always arrow, although admirable in many other respects. However, two desirable non-arrowing clones, M.167/32 and M.168/32, have now been obtained. Judging by their yields, under *Phytalus* conditions, in their 2nd and 3rd trials, these two varieties should go far towards solving the variety problem in *Phytalus*-infested areas.

A number of seedlings of the above parentage were back-crossed with noble canes during the crossing season to improve the type.

A. GLENDON HILL,
Senior Geneticist.

DEPARTMENT OF AGRICULTURE

B.—PHYSIOLOGICAL DIVISION.

As in previous years the Physiological Division has been concerned mainly with root-investigations, including, on the one hand, fundamental investigations of Sugarcane root-systems as affected by variety and environment, and, on the other, field experiments to test the practical applications formulated as a result of previous root work.

In the past attention has mainly been devoted to the distribution of roots in the soil, to the morphological features of the major root-types, and to the development of the root-system of the more important commercial varieties. The effects of various cultural practices on root development have also been elucidated. In addition quantitative root development was followed in one variety and related to the aerial growth. The final quantitative evaluation of a root-system must, however, take into consideration the active absorbing system. Any quantitative observations on length or weight of roots assume a correlation between these values and the absorbing surface. If such is not the case, then data on the length or weight of roots have little practical value. A method of determining the actual surface of the sugarcane root-system engaged in absorption has now been worked out in detail. Several lines of investigation in this direction have been initiated and a considerable amount of important data already obtained.

The outstanding fundamental fact discovered, is that it does not follow, of necessity, that the absorbing surface of sugarcane is correlated either with the length or weight of roots.

The density of root-hairs varies widely according to age, variety, and environmental conditions. The differences in root hair density at different ages appear to be correlated with differences in the cycle or periodicity of growth in different varieties.

It is not considered, however, that such a difference in periodicity of growth explains the whole of the varietal differences observed. Some varieties develop a greater absorbing surface than others irrespective of any differences in the growth cycle.

The development of the absorbing surface both in virgin (or plant) canes and in ratoons is under investigation, and the influence of (1) age, (2) variety, and (3) environmental conditions, upon the density of root-hairs is being evaluated.

In addition, the relationship between the transpiring surface and the absorbing surface is being determined, as it is considered that the ratio $\frac{\text{Transpiring surface}}{\text{absorbing surface}}$ is a quotient of great physiological importance, particularly as a measure of drought resistance.

It is considered also that the extent of the absorbing surface may be of great importance in the determination of Phytalus resistance. Experiments to test the relationship between the absorbing surface and Phytalus resistance are in progress, the degree of Phytalus resistance being determined from the varietal behaviour under conditions of heavy natural infestation.

A close correlation between the extent of the absorbing surface and drought resistance has already been established, and a method of artificially inducing drought effects by root pruning, shows considerable promise as a method of testing the drought resistance of new seedlings.

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A preliminary investigation of the inheritance of root-characters in seedlings has been completed. In this investigation the female parent proved to have a preponderating effect on the root-system of the offspring. Further work is necessary, however, to substantiate the provisional conclusions arrived at.

The recommendations made as a result of previous root studies have been tested in the field. New methods of applying fertilisers gave 3 tons per acre more cane, where the method normally in vogue failed to produce a response.

The application of a late dressing of Nitrogen in February or March has been proved to have outstanding effects. In one field trial an increase in yield of 8 tons per acre, and a decrease of 50% in the number of arrows, was obtained when the additional Nitrogen was applied in early February.

In another trial where the Nitrogen was applied as late as April, no control of arrowing was obtained, but yields were, nevertheless, increased by over 4 tons per acre.

Further experiments on the time of application of Nitrogen, Potash, and Phosphate, have been initiated.

As a subordinate subject, the control of flowering has been investigated further; injection of various chemicals into the cane failed to have a marked effect on the time of arrowing. A vernalization experiment has been laid out with the main object of controlling arrowing: single-eye cuttings were successfully vernalized for this purpose.

Further information on the activities of the Physiological Division during the year may be obtained from Bulletins Nos. 10, 12, and 14 of the Sugarcane Research Station, from the Annual Report of the Sugarcane Research Station, and from various papers published during the year in *La Revue Agricole de l'Île Maurice*.

H. EVANS,

Physiological Botanist.

C.—BIO-CHEMICAL DIVISION.

The research programme formulated by the Bio-Chemist, Mr. N. Craig, was carried out as far as possible, during his overseas leave of absence, by the Scientific Assistant, Mr. Pierre Halais.

1.—Soil Studies.

A number of samples from soils derived from the "clay alteration" of basaltic rocks and associated with impeded drainage conditions were examined and contrasted with the more commonly occurring lateritic soils of the sugarcane areas.

New Methods of Soil Analysis.—New methods have been applied to local soils, chiefly for total phosphorus, available phosphorus (by alkaline extraction with hot potassium carbonate) and exchangeable magnesium. The elaborate method previously used for the determination of exchangeable potassium has been improved and is now suitable for detailed soil survey work.

DEPARTMENT OF AGRICULTURE

Phosphate studies.—Surface accumulation of phosphorus in some top soils is artificial in that it is exaggerated by intensive sugarcane cultivation. Carelessly cultivated top soils like subsoils remain relatively poor in phosphorus. Broadly speaking, the soils rich in total phosphorus show high proportions of "available" phosphorus by Potassium carbonate extraction (Method of Whitney and Gardiner, 1936). However, soils of equal total phosphorus content yield more available phosphorus when the reaction is above pH 6.0. For lateritic soils alkaline extraction dissolves 10 times more phosphorus than acid extraction (e.g. Citric or Truog methods), while for soils of the "clay alteration" the 2 kinds of extraction yield comparable results. New light has been shed on the debated question of phosphate needs, by simultaneously applying the following soil tests: total phosphorus, "available" phosphorus, (by both potassium carbonate and Truog methods) and soil reaction.

For soils that are still poor, large phosphate applications at the bottom of the planting holes to enrich the usually deficient subsoil are advocated, while at the same time soil reaction, through moderate lime or coral sand amendments, should be kept above pH 6.0, in order to ensure a better utilisation of the applied phosphate.

Exchangeable Bases.—In the case of lateritic soils down to 3-4 feet depth, the relative proportion of exchangeable bases is almost constant and on an equivalent basis works out at 73.5% CaO, 25% NgO and 3.5% K₂O, in spite of the fact that the absolute amounts vary enormously as a consequence of different leaching intensities. Soils from the "clay alteration" on the other hand, contain much more magnesium, especially in the subsoils. The average molecular exchangeable CaO, NgO ratio is equal to 3.4 and 3.9 in the Top soil and subsoil (up to 4 ft.) respectively for the lateritic soils, while the average ratio is 1.2 in the "clay" top soil and falls to 0.4 in the clay subsoils (up to 3 ft.)

The "true laterites" that have been leached of the greater part of their magnesium will possibly benefit from magnesium rich fertilisers. On the other hand, some "clay" soils may contain excessive amounts of magnesium and could be improved by efficient drainage.

Relative Change of Soil Composition with Depth. This has been investigated on 7 representative soil "profiles" from the cultivated sugarcane areas. For the mature lateritic soils selected, the results of soil analyses have been worked out for the 1st, 2nd, and 3rd foot of soil separately. There was no change in the intensity of lateritic decomposition and soil reaction with depth. In the case of exchangeable calcium and magnesium, a drop of about 50% was found in the 2nd and 3rd foot as compared to the top foot. A decrease in organic matter, exchangeable potassium and available phosphorus, however, greatly exceeds 50%.

A relative poverty of the subsoil is the general rule with local lateritic soils. For this reason, increasing the arable soil depths, through adequate cultivation and fertilisation, should attract considerable attention.

Detailed soil Surveys.—Surveys of four sugarcane estates were made by the factory chemists under the direction of the staff of the Bio-Chemical Division and tentative recommendations for fertilisation made. These surveys will be very useful in locating future field experiments.

Foliar Diagnosis.—Chemical analysis of the third leaf blade of BH.10(12) canes collected from various manurial trials were made and the physiological ratios calculated. On a poor soil at Réduit, absorption of added P₂O₅ and

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K₂O has been demonstrated, and a case of antagonism between potassium, calcium and magnesium established. This new method could only be used on a practical scale for the determination of fertiliser needs provided ideal or balanced physiological ratios are proved to be associated with highest yields.

2.—Manurial Trials.

Conditions for high sucrose yield were exceedingly favourable during the crop year, the rainfall, though somewhat low, being early and well distributed. The sugarcane trials reaped have, consequently, shown increased yields through fertiliser applications while the cane quality has not been appreciably affected.

At Réduit, high chemical fertilisation plots showed an increase of 14 tons, of cane per acre, together with improved sucrose content, over low fertilised controls. The outside rows of the low fertilised plots, adjacent to the heavy fertilised plots were definitely heavier yielders than the corresponding inner rows.

Though not statistically significant, the following results with virgins at St André (irrigated) and Queen Victoria have been obtained:

At both centres, applications of F.Y.M. in two doses, resulted in a slight increase in yield over a single application of the same amount of F.Y.M. at planting time.

At St. André, yields were in favour of heavy chemical fertilisation, while at Queen Victoria, F.Y.M. plus moderate chemical fertilisation appeared to be superior.

One trial at St. André showed the superiority of concentrated fertilisers (C.C.F.) over straight fertilisers, while at Queen Victoria the reverse was found.

Two trials at Bel Air St. Félix S.E., and Benarès S.E., have now been reaped in virgins, first and 2nd ratoons. The results obtained point to the following conclusions:

At Bel Air St. Félix: (a) 12 tons of F.Y.M. applied to virgins slight increased the mean yields; (b) nitrogen fertilisation gave a significant response particularly in the absence of F.Y.M.; (c) potash did not result in increased yields.

At Bénarès S.E.: (a) in spite of a basal treatment of 20 tons of F.Y.M. and 150 kgs guano phosphaté per acre to virgins, mean increases of 8.3 tons cane per acre were obtained as a result of applying complete fertilisers; (b) nitrogen and phosphates were very effective; (c) there was no response to potash.

The results of 7 trials conducted during the year with 1st and 2nd ratoons of BH.10(12) and White Tanna at Grande Savanne have shown that: (a) omission of nitrogen in the chemical mixture always results in decreased yields varying from 1.4 to 5.9 tons of cane per acre; (b) omission of phosphate is detrimental, decreases of 1.0 to 6.1 tons cane per acre being obtained; (c) omission of potash on the other hand resulted in decreased yields in only one out of 6 trials.

PIERRE HALAIS,

Scientific Assistant
for Bio-Chemist.

DEPARTMENT OF AGRICULTURE

AGRICULTURAL DIVISION.

1.—Central Experimental Station, Réduit.

The propagation of promising new cane varieties was extended in order to meet increasing applications of planting material from planters. 24,204 cane cuttings were sold, and fifty-eight tons of canes not required for propagation were purchased by Trianon Estate. The following cane varieties raised by the Sugarcane Research Station were propagated, viz:

M. 10/30 ; M. 13/30 ; M.108/30 ; M.113/30 ; and M.171/30 ;
M. 65/31 ; M. 68/31 ; M. 72/31 ; M. 73/31 ; M. 81/31 ; M. 94/31 ;
M.96/31 ; M.107/31 ; M.111/31 ; M.115/31 ; and M.140/31 ;
M. 20/32 ; M.108/32 ; M.127/32 ; and M.130/32.

An additional multiplication plot was established for selected cane varieties. Steps have also been taken to acquire more land in the vicinity of the Station for plantations of economic crops.

Four acres of Smooth Cayenne pineapples were planted under manurial experiments and also to propagate this variety. It is intended to establish demonstration plots of pineapples at Trianon, Britannia, and Mon Rocher Estates. Ten acres will be laid out under manurial and spacing trials.

The Colonial Development Fund have contributed £1,000 towards the cost of these trials.

Plantations of various food crops such as maize, sweet potatoes, manioc, yams, and ground nuts, were made in order to have seeds, tubers, and cuttings available for distribution to applicants.

The experimental plantation of *Hydnocarpus Wightiana*, Blume (Chaulmoogra) made in 1934 is now well established. A windbreak of *Pithecolobium unguis-cati*, Benth. (Broad and Cheese plant) has been planted to shelter the young trees from prevailing winds.

Many coffee trees (*Coffea excelsa*, Cheval) in Field 15 bore a good crop of berries ; the seeds were collected and sent to Barkly Experiment Station for sowing.

Ninety *Ceratonia siliqua*, Linn. (Carob tree) were planted in Fields 17 and 20 ; growth was slow at first, but the plants are now doing well.

A small trial plantation of *Derris elliptica*, Benth. and *Derris malaccensis*, Prain. (Tuba plant) was laid out in Field 9. The plants are growing satisfactorily and good yields are expected.

Plants and seeds were received from the following Agricultural and Botanical Institutions and persons:

Curator Botanic Gardens, Buitenzorg, Java ;
Director, Royal Botanical Gardens, Kew, England ;
Coconut Grove Palmetum, Florida, U.S.A. ;
Director of Agriculture, British Guiana ;
Harvard University, Cuba ;
Adviser of Agriculture, Malay States ;
Director of Plant Industry, Manila, Philippines ;
Director of Agriculture, Nicaragua ;
Royal Palm Nurseries, Florida, U.S.A. ;
Mr. R. Holloway, Australia ;
Director of Agriculture, Zanzibar.

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Plants and seeds were sent in exchange as follows:

Director, Coconut Grove Palmetum, Florida, U.S.A. ;
Director of Agriculture, Barbados ;
Mr. R. Holloway, Australia ;
Municipal Engineer, Ceylon ;
Harvard University, Cuba ;
Department of Agriculture, Gold Coast ;
Director of Plant Industry, Manila Philippines.

2.—Barkly Experiment Station.

A large number of economic plants were raised in the nursery for sale to the public and also for distribution to the Agricultural Superintendent, Rodrigues, Allotments, School Gardens and Government Institutions. As in the past, many planters and other persons interested in Agriculture visited the Station to buy plants and to obtain information.

The trees in the orchard are making satisfactory growth ; several fruited for the first time. It was observed that none of the recently imported *Litchis* varieties showed any superior qualities as compared with the local ones. The Indian mangoes which fruited were large, juicy, and fibreless, but they do not possess the superior flavour of the best Mauritian types.

A few Pecan nut trees flowered and bore a small crop of nuts ; it is intended to raise as many seedlings as possible of this interesting tree.

The Pemba Dwarf Coconuts planted in 1932 are growing well ; as this variety is in great demand locally, nuts have been ordered and were received from Zanzibar for propagation.

Many young plants of *Anacardium occidentale*, Linn. (Cashew Nut) were propagated in order to establish this hardy and useful tree in the warmer districts of the island.

Selections of promising varieties of Citrus were made in the experimental Citrus plot planted in 1932.

Many seedlings, cuttings and grafts of the following fruit trees were made viz: Bread fruit, figs, peaches, apples, sapodilla, star apples, avocado pears, annonas, loquats, Japanese persimmon, etc.

The revenue for the sale of plants during the year amounted to Rs. 1,404.20.

Seeds and plants of *Ceratonia siliqua* Linn. (Carob tree) were distributed free for trial to persons who had applied for them.

The Chaulmoogra trees bore an abundant crop of fruit, some of the seeds were sown and the remainder were sent to the Chemical Division of the Department for oil extraction.

Planting material of various food crops were given free to plot holders on the Barkly Allotments.

Eighty-seven *Cinchona Ledgeriana*, Moens. which were planted in the " Trou aux Cerfs " at Curepipe in 1933, are now from 8 to 12 feet high ; they are in good condition, but it is doubtful whether *Cinchona* will ever be grown on a large scale in the Colony, as the tree is brittle and easily damaged by cyclones.

Seven heifers from the Government Dairy were kept at the Station ; the animals are in good condition.

DEPARTMENT OF AGRICULTURE

The rainfall at this Station amounted to 1,049.8 millimetres during the year. The rains were well distributed as 533.9 millimetres fell during the first six months and 515.9 millimetres in the second half year.

Six unpaid apprentices were employed as learners in the nursery and orchard; those giving satisfaction in their work and conduct are after a probationary period, employed permanently in the Department.

3.—Royal Botanical Gardens. Pamplemousses.

Economic Section. The following new sugarcane varieties were propagated in the varietal plot:

M. 10/30; M. 13/30; M.108/30; M.113/30; and M.171/30;
M. 9/31; M. 65/31; M. 73/31; M.107/31; M.111/31; M.115/31;
M.140/31; and M.156/31;
M. 20/32; M.108/32; M.127/32; M.130/32; and M.134/32.

Standard varieties such as BH.10 12, SC.12/4; P.O.J.2727, and M.14 29 were planted in rows at intervals for comparison.

A limited number of cuttings of some of the new varieties have been distributed to planters. Forty-seven tons of canes from the "Mon Rocher" plot were sold to "Belle Vue" factory, and six and a half tons from Mon Plaisir field to "Beau Plan" estate.

A small field was planted with the Smooth Cayenne pineapple so as to be able obtain sufficient planting material for the Demonstration Plots.

Part of the economic section was planted with the usual food crops, cuttings, seeds, and tubers, of which were supplied free to School Gardens and to the allottees at "Bois Marchand" and "Richelieu."

The Vanilla and Pepper plantations made last year are well established. It is expected that a small crop will be obtained in 1937.

Propagation of selected varieties of fruit trees continued to receive careful attention. 669 mango grafts and 306 litchi layers were made and sent to Abercrombie Nursery and Barkly Experiment Station for sale to the public.

The litchi crop was sold by auction for Rs. 240, as compared with Rs. 430 for 1935, and Rs. 790 for 1933. This very low price was due to the abundant crop of litchis in Mauritius this season.

Ornamental Section.—This section was kept in good condition throughout the year. All the young palms recently planted along the principal avenues were carefully attended to and vacancies were replaced where required. The kiosks, bridges, canals, and railing in the gardens were repaired.

Several plants of *Victoria regia*, Lindl., the giant water lily of British Guiana, were successfully raised in the Nursery. Arrangements have been made to grow them in one of the ponds; necessary precautions were taken to protect them from the fish *Gouramia-Osphromenus olfax*, Comm. by means of a wire-netting fence. The establishment of this rare and interesting aquatic plant is a great acquisition to the gardens. Several previous attempts at establishment have failed.

The rainfall for the year was 57.17 inches.

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4.—Abercrombie Nursery.

A great number of ornamental and economic plants were raised in the Nursery.

The following were sold to the public: 484 Litchi layers, 142 mango grafts, 71 Citrus grafts and seedlings, 181 Palms (various) and 2,187 Miscellaneous plants.

The sales during the year amounted to Rs. 1,052.55 cs., as compared with Rs. 812.85 cs. for the previous year.

5.—Government House Grounds.

Considerable improvements were made to the Government House grounds at Port Louis: the front part was planted with lawn grass and various ornamental plants.

Le Réduit grounds were maintained in good condition throughout the year.

6.—Food Settlement, St. Martin and La Ferme.

The plots on this land were, as in the past, leased to shareholders of the local Co-operative Credit Society. Good crops of maize, manioc, sweet potatoes, and vegetables were raised. The Assistant Agricultural Officer regularly visits the settlers and gives them advice. Control has been tightened during the year.

7.—School Gardens and Agricultural Instruction.

There is a general improvement in the lay-out and upkeep of the great majority of the thirty-two registered school gardens. This is due to the increased interest taken in them by their respective Head Teachers, staffs and pupils. The condition of some aided school gardens, which last year showed a falling off in general upkeep, has improved.

Prizes were awarded as follows:

- | | |
|--------------------------|---------------------------------------|
| 1st Prize of Rs. 40 to | Escalier Government School; |
| 2nd " 30 " | Old Grand Port R.C Aided School; |
| 3rd " 25 " | Ruisseau Rose Government School; |
| 4th " 20 " | Plaine des Papayes Government School. |

Two prizes of Rs. 12.50 each to Crève Cœur and Chemin Grenier Government Schools.

One prize of Rs. 10 to Mahebourg Government School. Ten Prizes of Rs. 5 each to the following:

- | | |
|--|---|
| Bambous Government School; | |
| Beau Bois " " | ; |
| Bois Cheri " " | ; |
| Camp Diable Government School; | |
| Chemin Grenier R.C. Aided School; | |
| Grand River S.E. Government School; | |
| Mare d'Albert " " | ; |
| Plaisance Orphanage C. of E. Aided School; | |
| Poudre d'Or Government School; | |
| Quatre Bornes " " | ; |

DEPARTMENT OF AGRICULTURE

The three Agricultural Instructors were fully occupied throughout the year visiting small planters in various parts of the island, in order to advise them as to the best methods of cultivation. Practical demonstrations were given showing how to use insecticides and fungicides to protect crops from various diseases and pests. They also recommended trials of different fertilizers and propagation of new varieties of food crops. Reports of these visits are weekly submitted to the Director who is thus able to follow the work performed.

One of the Agricultural Instructors, who is also an Inspector of the Co-operative Credit Societies, is thus able to get in touch with a large number of small planters who are shareholders of these societies.

The Agricultural Instructors also regularly inspect the thirty-two registered School Gardens giving demonstrations and short lectures to the pupils on various questions of Agricultural interest.

8.—Allotments.

A new land settlement was established at Richelieu for unemployed persons. Two-acre plots, each provided with a straw hut, kitchen, etc., were given to twenty-five persons selected by the Allotments Committee. The settlers also received eight rupees per month until their crops are ready to be harvested.

Several unsuitable persons who did not give satisfaction had to be evicted and replaced by others on the waiting list. On the whole, the work done by the majority of the allottees is good, and it is hoped that improvements will continue in the future. Water for irrigation and drinking purposes is supplied free. The allottees also get a supply of quinine and loans of tools when required.

Progress was made on the other allotments where, as in the past, the allottees receive practical advice for planting crops, and free distribution of timber, thatch for huts, and planting material by this Department.

The number of allottees on the various allotments is as follows:

Richelieu	...	25
Curepipe	...	7
Floréal	...	2
Bois Marchand	...	32
Barkly	...	49
Malherbe	...	18
Total	...	133

9.—Visits to Estates and Planters.

The Senior Agricultural Officer paid seventy-one visits to estates during the year; he interviewed planters and discussed with them various questions of Agricultural interest, he also gave advice where required about the planting of selected new varieties of canes, improvements of orchards, propagation of food plants of *Phytalus* parasites selection of suitable trees for wind belts and river reserves, trials of interesting tropical crops, destruction of noxious and poisonous plants, etc. As a result of these visits many planters called at the experimental stations at Réduit, Pamplémousses, and Barkly, to observe the work in progress.

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The Agronomist made seventy-six visits to estates and planters to superintend manurial trials with sugarcane and to give general advice on agricultural questions of various kinds. He also carried out a series of experiments on pineapples, potatoes, and compost making. During three days a week, the Agronomist is employed with the Sugarcane Research Division.

10.—College of Agriculture.

The usual number of lectures were delivered at the Mauritius Agricultural College.

11.—Export of Litchis.

The 542 cases of litchis which were shipped by Messrs. Pearmain & Co. in December, 1935, arrived in London in fairly good condition; the average price realized was 1 6 per pound, which gave a profit; this encouraged the exporters to effect further shipments in 1936.

On the 4th December, 1936, 300 cases were sent by the S.S. *Bontekæ*; they were transhipped at Cape Town on the S.S. *Balmoral Castle*. These found a good market, but the average price realized was about 1 —per pound, a drop of 6d. on last year; this was due to competition with South African fruit. The loss due to wastage on this consignment was about 20%; nevertheless the financial results were again satisfactory.

Another shipment of 543 cases on 5.1.37, by the S.S. *Houtman*, resulted in a loss of about 75%, owing to deterioration. The price obtained was only 9d. per pound.

Exporters have formed the opinion that it is not advisable to ship late in the season as the fruit is apparently over-ripe. Valuable information has been gained from these trial shipments and it is intended to take advantage of it in future. A different method of packing will be adopted; the boxes will only contain eight pounds instead of twelve pounds of fruit. Shipment will, of course, be made as early as possible in the season.

An important factor which causes much damage to litchis, is the present method of conveying the boxes from shore to ship, as this entails their exposure for a period of about two hours to temperature of 110° to 120°F. (i.e. the direct rays of the mid-day sun). The sudden rise in temperature after leaving the cool chamber is held to be responsible for most of the wastage, and exporters are endeavouring to make arrangements with the agents of shipping companies to send in future consignments on board either early in the morning or late in the evening.

Another exporter, M. E. Sauzier, shipped 1,200 boxes on 5th December by S.S. *Bontekæ*, they arrived in London in good condition. The loss was about 15–20%. A profit was obtained on this shipment.

A second consignment forwarded by the S.S. *Roggeveen*, on 23rd December gave unsatisfactory results; probably due to the lateness of the season.

The litchi exporters have recently had a conference with Messrs. Porter and Patton of South Africa with a view to making arrangements to place limited quantities of litchis at a time on the London market in order to avoid competition. Mr. Porter is the largest litchi grower in Natal and his partner is in charge of shipment and marketing of all kinds of fruits; they came to Mauritius in order to discuss matters. The question is now being carefully considered and any action taken will be to the advantage of the local new industry.

C. A. O'CONNOR,
Senior Agricultural Officer.

DEPARTMENT OF AGRICULTURE
CO-OPERATIVE CREDIT DIVISION.

1.—Administration.

(a) The following changes took place in the staff during the year : (i) The writer returned from leave on the 31st March. During the period January 1st to March 30th, Mr. L. Madhoo, the whole time Inspector, acted as Assistant Registrar. (ii) The strength of the Inspectorate during the year consisted of myself (on leave for three months), one whole time Inspector (Mr. L. Madhoo), and one part-time Inspector (Mr. E. Bedsy), with combined duties of Agricultural Instructor. During my absence Mr. G. Bauristhène, Agricultural Instructor, acted as part-time Inspector.

(b) The year under review was one of very heavy strain on the staff as a result of : (i) The continuation of special attention to the improvement of bad Societies ; (ii) The intensive programme of inspections and supervision ; (iii) The assistance to the Societies in the recovery of overdue debts held by members—a difficult and uphill task consequent upon the low price of sugar still prevailing ; (iv) The bringing into operation of the new legislation governing the working of the Societies ; (v) The handling of the paper aspect of the movement, which has more than doubled during the last four years ; (vi) The fostering of newly registered Societies and general propagand work in connection with the movement.

Unavoidably, a great deal of routine work falls on the staff which should be free to concentrate upon problems of a more important nature. In order to improve this condition of affairs the Registrar is considering a scheme which he will put forward at a suitable period.

2.—Capital.

The total working capital of the Societies which last year stood at Rs. 267,156, was this year Rs. 263,086 ; this decrease is due to (i) the withdrawal of shares by members having no agricultural interest ; (ii) the repayment of instalments of Government loans ; (iii) the charging to the Reserve Fund of (a) bad debts which had become irrecoverable, (b) expenses incurred for the starting of planting material plots by some Societies ; (iv) the withdrawal of deposits by non-members.

On the occasion of the annual general meetings of the Societies held in July-August last, the members were advised to make arrangements for the provision of an accumulation of owned capital with which, in the event of consecutive harvest failures or other calamities, they would be able to finance their requirements thereby rendering them independent of borrowed capital after such occurrences.

It is observed that in the same Society the shareholdings per member are uneven, with the result that members having a large quantity of land and taking big loans hold the same amount of shares or even less than poorer members. The fixing of an even shareholding per member would create disabilities against poor members or persons desirous of membership. On the other hand it would favour members taking big loans. To obviate this anomaly, and in order to get shareholdings on a more or less level basis, it has been suggested to the members that they should contribute towards share capital in proportion to the holdings for the cultivation of which they would take loans from the Societies ; thus a basis of two shares for every arpent of land has been fixed. Members have been advised to do so gra-

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dually until the total required is reached. In order to facilitate them in this direction, the Committees have accepted to consider the question of allowing them to obtain shares, or instalments thereof, by deduction from loans granted to them.

It is a pleasure to be able to record that the suggestion has been widely accepted and that members are adopting this principle.

3.—Government Advances.

No advance from State Funds was made during the year : the amount still due to Government by Societies on 31st December was Rs. 2,210.

4.—Reserve Fund.

The total reserve Fund of the Societies is now 3.06 times the value of the shares originally contributed by the members.

5.—Dissolved Societies.

The number of dissolved Societies which, last year, stood at ten, remained the same. The depression still prevailing in the sugar industry has made progress very difficult and liquidation proceedings have not been closed in the case of any of these Societies. The majority of the debtors of these Societies have, before the dissolution thereof, either alienated their properties or have made over such properties to their outside creditors in settlement of debts due to them. In many other cases, the debts held by the debtors have been time-barred, and in some others both the debtors and their sureties are landless. This condition of affairs has rendered the recovery of the debts due to the Societies a most exacting task. These Societies have now been under liquidation for more than five years, and this alone is an indication of the difficulties and delays involved in the process ; especially when the proper type of liquidator cannot be found. It is not unlikely that a considerable sum will, in the end, have to be written off.

6.—Societies, Dividend and Interest.

The number of Societies in operation in the Island on the 31st December was 33. Four new Societies were registered during the year, after educating the members thereof on sound co-operative lines. Applications for the formation of new Societies have been received from six other villages ; but their registration has been postponed for consideration to next year.

A dividend of $2\frac{1}{2}\%$ was declared by the Eastern Triolet Co-operative Credit Society. Nine Societies reduced the rate of interest on loans to their members ; so that now two Societies are working at 5% , twelve at 6% , nine at 7% , two at 8% , two at 9% , two at 10% , and four at 12% .

7.—Loans to Members and Recoveries.

The amount the Societies disbursed as loans to their members was higher than in the previous year. The total amount loaned out has been effected by the Committees of the Societies and invariably in the presence of the inspecting officers after (i) the deeds establishing the borrowers' rights as owners or occupiers of the lands for the cultivation of which they required loans, had been noted in the Register of Borrowing Power ; (ii) a careful scrutiny of the circumstances connected with the applications for such loans. The borrowers' total requirements for the year were not, as formerly, effected in lump sums, but in many cases were made by instalments according to

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seasonal needs. This procedure, although an up-hill job, is proving very effective inasmuch as it is clearly a step towards (i) preventing committee members from making abuse of their powers in issuing loans to their friends and relatives with excessive liberality or for non-productive purposes ; (ii) exercising a check on committees in the matter of the pernicious practice of effecting adjustments of repayments towards fresh loans.

The total amount of loans recovered during the year showed a marked improvement, which can safely be attributed to (i) the good crop realised, notwithstanding the main factor which is causing much anxiety, i.e. the low price of sugar ; (ii) the official assistance given to the committees of management in the recovery of overdue debts ; (iii) the vigilance exercised by the committees and the inspecting officers by regular and close examination of the books, coupled with a careful enquiry into the affairs of the members and the manner in which they have utilized their loans.

Of the total loans issued and recoverable during the year 2.6% only has fallen in arrears. The total of the overdue debts which last year stood at Rs. 97,053, was this year Rs. 62,623.

The Societies devote their attention chiefly to the grant of loans for cane cultivation ; in a few cases for tobacco and vegetables, and in two cases for buying cattle.

8.—General Meetings.

The Annual General Meetings of the Societies were held during the months of July, August, and September. An extraordinary general meeting of the Pont Praslin Society was also held in March. At these meetings the books of the Societies were closely scrutinised by the Registrar. At the same time the debtors present were minutely examined as to their exact financial position. Letters reviewing the affairs of each Society as well as programmes of work to be executed were prepared and sent to the Presidents for fulfilment of necessary action.

9.—Planting Material Plots.

The plot started by the Saint André Society in 1933 is being successfully maintained. Eight new plots have been started during the year. The Department of Agriculture supplied free of charge 6,450 canes of better varieties to these Societies. The plots are being maintained at the Societies' own expenses.

10.—Conclusion.

In general, the attention of the staff was directed towards the consolidation as well as the improvement of poor Societies. Greater attention was bestowed on the education of the members and the office bearers in the principles of co-operation. The year's working is satisfactory and the financial condition of the Societies is growing sounder. Only one Society, the Grand Gaube, has not made any progress, despite every effort made to revive it. Probably it will have to be dissolved.

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As in the previous year, all the legal affairs of the Societies were placed in the hand of an Attorney. One judgment to undergo imprisonment was obtained against a debtor who had alienated his holdings as a means of avoiding his responsibility towards his Society.

Once more it is interesting to note that the policy of placing all the Societies affairs in the hand of an Attorney is proving very valuable.

In conclusion, I wish to express satisfaction in the manner which the whole-time Inspector and the part-time Inspector have discharged their duties.

M. BURRENCHOBAY,

Assistant Registrar.

Co-operative Credit Societies.

BOTANICAL AND MYCOLOGICAL DIVISION.

1.—Diseases of Sugar Cane (*Saccharum spp.*)

GUMMING (caused by *Bacterium vasculorum* (Cobb) G. Smith).

Resistance trials were carried out on seedlings produced by the Sugar-cane Research Station as in former years. A number of seedlings were discarded on the basis of degree of susceptibility to the disease, and some others which had a doubtful reaction are to be retested in a subsequent trial. A large number of seedlings were found to be commercially resistant.

On account of the fact that the liability to the development of leaf symptoms and the liability to the development of systemic infection, or stem symptoms, are apparently two independent characters, and on account of the possibility that new varieties of canes may become eventually exposed to infection by strains of the bacterium different from that employed in the resistance trial, the future policy regarding testing of gumming resistance is as follows:

(a) The infected material used as a source of gum for inoculation of the border rows will be selected from several localities and the gum from these several localities mixed together, so as to get as many strains of the organism as possible in the resistance trial.

(b) Any seedlings that are not *highly* resistant in any test, on the basis of development of leaf infection, will be subjected to a further test.

(c) The stems of all seedlings which are found to be commercially resistant, on the basis of *leaf* infection, will be examined immediately for stem symptoms.

(d) Inspection of the resistance trial plots will be made at least once every two months.

LEAF SCALD (caused by *Bacterium albilineans* Ashby).

The leaf scald resistance trial plot planted out in November, 1935, was kept under observation. Final observations will be recorded during the crop of 1937. For testing scald resistance in cane varieties no better method than knife inoculation of cuttings has yet been discovered.

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Pure cultures of *B. albilineans* Ashby were tested for their pathogenicity on cuttings of DK.74. The results were positive. This was supplementary to the work on the effect of pH of the medium on the rate of growth of the organism. pH 6.8 to 7.0 was most favourable to its growth.

The addition to the medium (Wilbrink's peptone saccharose) of .003% of anhydrous sodium sulphite as recommended by Mr. A. F. Bell, of Queensland, increases the speed of growth of the organism.

Investigations on the cultural and physiological reactions of *B. vasculorum* (Cobb) G.Sm. and *B. albilineans* Ashby were carried out. As far as the former was concerned, organisms from six different sources in the Island were studied. The differences in the reactions of these organisms respectively were not considered sufficient to place them in different strains.

SMUT (*Ustilago scitaminea* (Rab.) Syd.).

The resistance trial plot reported on in 1935 was uprooted early in the year under review, and a second plot laid out on slightly modified lines. The results obtained in the first trial were interesting and showed that the method is a promising one. With slight modifications in the method it is hoped that more reliable results will be obtained. Observations on the plot were carried out at regular intervals.

EYE-SPOT (*Helminthosporium ocellum* Faris).

The field of BH.10/12 reported on in 1935 as suffering from a severe attack of this disease on young "baba" shoots, was again inspected in January, when the temperature was higher than it was in November, 1935. The attack of the disease on the young shoots was found to be less severe than it was at the time of the first inspection.

POKKAH-BOENG.

Investigations were carried out on a form of "pokkah-boeng" on young shoots of BH.10/12 at the Central Experiment Station. Three different types of bacteria were isolated from diseased tissue, but none was found to be parasitic.

RED ROT (*Colletotrichum falcatum* Went).

A serious outbreak of this disease on the variety Selangor Seedling (a Java cane) was investigated on an estate in the upper part of Grand Port. The attack chiefly followed borer injury. Apparently conditions prevailing in this region are unsuitable to propagation of this variety, which seems to do well in some other localities.

LIGHTNING INJURY.

Cases were investigated in several parts of the island and the nature of the injury pointed out to planters.

2.—Diseases of Tobacco (*Nicotiana tabacum* L.)

BLACK SHANK (caused by *Phytophthora parasitica* Dast. emend. Ashby var. *nicotianæ*).

There appeared to have been a greater incidence of this disease between April and June of this year than in former years. Perhaps climatic conditions may have had some effect or neglect of treatment of seed beds.

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It would seem as a result of enquiries on estates that proper treatment of seed beds with Cheshunt Compound does result in diminished infection. The practice of transplanting plants from seed beds to nurseries (which is the general practice here) may also tend to increase the incidence of the disease in nurseries through the wounding of roots in the process of transplanting, although much of the infection in young plants seems to enter through the leaves in contact with the soil. Advice to planters on the proper treatment of seed beds was renewed. As the winter months approached the incidence of black shank diminished.

Seed box experiments on the control of black shank were conducted at Réduit. The results of these experiments were not conclusive, as it was found difficult to infect plants with black shank under Réduit conditions.

Mosaic was again found difficult to control in the Black River district. The later planted crop became more infected than the earlier.

Further observations on the apparently new virus disease associated with enation production on the leaves have pointed to the conclusion that it is a form of mosaic. A leaflet on the subject was published.

What at first sight seemed to be the symptoms of "leaf curl" or "kropoek" disease were observed on a single tobacco plant in the Black River district in June. Transmission experiments by grafting gave negative results. The abnormality is not, therefore, now regarded as a virus disease. Of a number of seedlings from the abnormal plant one showed signs of vein thickening.

An article on the subject was written for publication in *Tropical Agriculture*.

3.—Diseases of Other Crops.

PINEAPPLE (*Ananas comosus* (Linn.) Merrill).

Studies were carried out on an apparent disease on young leaves, characterised by brown sunken spots which subsequently gave rise to holes. There was a profuse exudation of gelatinous matter. Bacteria were isolated from diseased tissues, but they were not found to be pathogenic.

POTATO (*Solanum tuberosum* L.).

A plot was laid out with potatoes at the Central Experiment Station to determine the comparative efficacies of Burgundy Mixture and Bouisul respectively as sprays against *Phytophthora infestans* (Mont.) de Bary. Owing to the excessively dry conditions prevailing in the plot, however, the experiment was abandoned until such time as arrangements can be made to irrigate the land.

Preliminary studies were carried out on what seems to be a virus disease of potatoes characterised chiefly by a dark browning to blackening of the tissues between the secondary veins.

What appears to be another virus disease is characterised by a bronzing of upper leaves, followed by a kind of citron yellowing of edges, and by curling and drying from margins inwards. Drying affects the youngest leaves first. The disease results in the death of a large proportion of the shoots.

"PALMISTE BLANC" (*Dictyosperma album* Wendl.).

The Scientific Assistant carried out further investigations on the bacteria associated with "bud rot" of this palm. Two types of bacteria were found associated with diseased tissue. Cultural and inoculation work was carried out.

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PARSELEY (*Petroselinum hortense* Hoffm.).

The Scientific Assistant carried out studies on a wilt of this crop. A bacterium was isolated and proved to be pathogenic. Studies on the morphology, and cultural and physiological reactions of the organism were carried out.

GREEN PEAS (*Pisum sativum* L.).

Observations were made and recorded on the differential reactions of several varieties to powdery mildew (*Oidium* sp.) at the Barkly Experiment Station.

SWEET PEA (*Lathyrus odoratus* L.).

A wilt of the flower head *Glomerella cingulata* (Stonem) S. and V.S. A similar disease was recorded on *Gerbera* sp.

POIS MASCATE (*Mucuna deeringiana* (Bort) Holland).

Germination tests were carried out on "Pois Mascate" (*Mucuna deeringiana* (Bort) Holland) seed from several parts of the island. The results of these were written up in the form of a bulletin.

Pinus spp.

Death of young pine trees of different species was reported by the Forest Department, and investigated by this Division. A fungus with mycelium strongly suggesting that of *Armillaria mellea* (Vahl.) Quel. was found in the bark and between the bark and wood of affected trees.

4.—General.

Much time was spent during the year on ensilage experiments. Acknowledgements are made with thanks of the valuable assistance of the Imperial Mycological Institute and the Royal Botanic Gardens, Kew, in the identification of specimens.

During the year a revised list of plant diseases in Mauritius was prepared by the undersigned.

The undersigned delivered four lectures a week and supervised laboratory work in Botany and Mycology at the College of Agriculture.

E. F. S. SHEPHERD,
Botanist and Mycologist.

SUGAR TECHNOLOGICAL DIVISION.

1.—Visits to Factories, Investigations, Etc.

The Sugar Technologist and the Assistant Sugar Technologist visited a great number of factories. Advice was given and investigations were carried out.

2.—Clarification of Cane Juice.

Experiments on the advantages of hot liming as compared with the local practice of cold liming were carried out on a factory scale after encouraging results obtained in the laboratory. Hot liming with a preliminary application of lime gives as a rule better results than cold liming. There is less scaling

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in the heaters, the rate of settling is more rapid and a purer juice is obtained. The mud is, however, more bulky. It was not possible to obtain good clarification of P.O.J.2878 juices by either the cold, the hot, or the pre-liming process. The pre-liming and double heating process gave, however, very good results in the laboratory with juices obtained from unmatured P.O.J.2878, and it is hoped that it will be possible to try this process on an industrial scale next year. Until definite results are obtained with this method the "sulpho phosphatation" is to be recommended for the treatment of the more refractory juices of P.O.J.2878. The quantity of phosphoric acid to be added per ton of cane is in certain cases as high as 400 grms.

3.—Mill-Feeding Devices.

The advisability of having pushers installed to cane mills was studied by the Assistant Sugar Technologist, and it was found that the advantages that could be expected from their use were the following:

1. A better grip of the rollers ;
2. A higher pressure at the front rollers ;
3. An increased efficiency.

Following these results five factories adopted the use of pushers.

4.—Crystallizers.

A series of tests were carried out in a number of factories to find out the merits of the different types (including rapid cooling crystallizers) used in Mauritius. The general conclusions arrived at can be summed up as follows:

For high grade massecuites rapid cooling crystallizers, especially the Werkspoor, give good results and are to be recommended for their efficiency and ease of operation. For other massecuites there would be no advantage to change from the local type of crystallizers fitted with cooling coils to more modern types.

5.—Polarization of Raw Sugars.

The influence of temperature upon the polarization of Mauritius raw sugars was studied and the results obtained showed that the widely used formula $P_{20} = P_t + [1 + .0003 (t - 20)]$ should always be applied.

6.—"Controle Mutuel" and Factory Results.

Thirty-five factories contributed to the "Controle Mutuel" and returns were distributed as usual.

The average percentage of sucrose in the cane was 13.67, as compared with 13.14 and 12.86, in 1935 and 1934 respectively. Both the sugar output (300,000 tons) and the sucrose in the cane for 1936 are record figures.

7.—Educational.

The usual duties in relation to lectures and practical demonstrations at the Agricultural College were performed by the Sugar Technologist and the Assistant Sugar Technologist. The students visited a number of sugar factories.

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8.—Miscellaneous.

The Sugar Technologist proceeded to Europe on leave of absence on the 18th March and resumed duty on the 20th October. The Assistant Sugar Technologist acted as Sugar Technologist during his absence. During his leave the Sugar Technologist attended the 9th session of the International Commission for Uniform Methods of Sugar Analysis as representative of the Société des Chimistes.

Articles were written for the *Revue Agricole* by the Sugar Technologist and by his assistant.

LOUIS BAISSAC,
Sugar Technologist.

VETERINARY DIVISION.

1.—Importation of Animals.

Animals imported from dependencies and foreign countries were as follows:

			From		From		
			Dependencies		Foreign Countries		
			1936	1935	1936	1935	
Cows and Oxen	...	...	492	284	...	5,767	4,407
Horses, Mules and Donkeys	...	...	15	10	...	15	11
Pigs	...	...	2,263	1,887	...	—	—
Sheep	...	...	637	569	...	2	—
Goats	...	...	4,981	3,847	...	—	—
Dogs	...	...	—	—	...	8	7
Turtles		...	275	170	...	—	—
Poultry	...	...	6,364	9,943	...	—	—

2.—Quarantine.

One Afrikander Bull and six Black Head Persian Rams were imported and placed under two months' quarantine before delivery to the owners. Four equines, four calves, twelve ewes and rams, and three donkeys, were placed under observation and examined before their despatch to the lesser dependencies. Eight dogs were kept under six months' quarantine at the Government kennels at Réduit.

3.—Contagious Diseases.

A. TUBERCULOSIS.

75 bovines were tested with tuberculin with three positive reactions; these animals were destroyed.

119 animals were, in 1935, treated with negative results.

The number of B.C.G. vaccine delivered during the year was 1,582, against 1,618 in 1935, and 1,571 in 1934.

B.—RED-WATER FEVER.

There were four cases recorded and animals recovered after treatment, as against 37 similar cases in 1935.

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C.—TRYPANOSOMIASIS.

The number of blood smears examined during the year was as follows:

						Total	Total
						1936	1935
		Equine	Bovine	Sheep	Goats		
Estates	...	11	16,940	21	—	16,972	10,562
Dairy animals	{ Government	—	1,238	—	—	1,238	1,316
	{ private	—	348	—	—	348	340
Draught Animals, Rouliers	...	—	426	—	—	426	1,115
Fort William Quarantine Station	...	180	195	14	151	540	211
Government Animals	...	82	24	—	—	106	115
Total		273	19,171	35	151	19,630	13,659

POSITIVE CASES.

1936— 2 Equines
66 Bovines

68 positive cases, out of which 39 cases of *T. Evansi*, and 28 of *T. vivax* and 1 of *T. Theileri*.

1935— 2 Equines
146 Bovines

148 positive cases, out of which 33 cases of *T. Evansi*, 113 cases of *T. Vivax*, and 2 of *T. Theileri*.

4.—Tetanus.

A case of Tetanus was detected in a mule of the Medical and Health Department: the animal eventually died. Two others were injected with antitetanus serum as a prophylactic measure.

The number of inspections in this connection made by the Veterinary staff stands as follows:

By the Veterinary Officer	...	207
„ Members of the staff	...	983
Total	...	1,190

5.—Abattoir Inspection.

(a) 64 surprise visits were paid in the different abattoirs of the colony. One carcass was seized at the request of the Sanitary Authorities, at Standley, for slaughtering outside an abattoir.

(b) 71 cows and heifers under age were allowed to be slaughtered, as compared with 63 in 1935.

6.—Agricultural College.

First- and third-year students were lectured to on anatomy, physiology, and pathology, during the year.

7.—Inspection of Dependencies.

(a) An inspection was made at Agaléga Island with a view to ascertaining cattle-breeding possibilities. One bull, one cow, and two heifers of the

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milk breed, were imported eventually in that dependency and are thriving well. The raising of horses and mules is attended with success at Agaléga.

(b) Rodrigues was also inspected and quite a good type of cattle is to be seen there now: the crossing of the local cows with "Normandy", "Sindi" and "Friesland" Bulls has resulted in a higher standard of animals. A pure bred Afrikander Bull is being imported in that Dependency and will certainly be an improvement towards a good beef type of cattle.

The introduction of new Friesland blood is under contemplation so that the milk production can also be improved.

The black head Persian rams recently introduced have met with great appreciation on the part of local breeders, and the resulting improvement in the breeding of sheep is quite noticeable.

The pig industry has further received considerable attention and some good quality boars have been introduced.

F. E. LIONNET,
Veterinary Officer.

ENTOMOLOGICAL DIVISION.

1.—Campaign against *Phytalus Smithi* Arrow.

During the last campaign, from October, 1935, to April, 1936, 339,000,800 adult beetles were collected and destroyed. The cost of this campaign was Rs. 58,167.92 cts. The campaign now in progress started in October; from this date, up to the 31st December, 1936, 101,336,381 adults have been captured. The number of insects captured during the corresponding period in 1935 was 222,759,859.

As a result of discussion of a memorandum submitted to the *Phytalus* Advisory Board by the *Phytalus* Investigation Officer and the Assistant Entomologist, it was decided that an attempt should be made during the present campaign to inaugurate, as an experiment, the cessation of adult collection in certain centres. With the co-operation of the planters concerned, the prohibition of collection of adults was enforced by Proclamation No. 24 of the 5th September, 1936, in the following infested centres: Etoile, Sans Souci, Olivia, Belle Rive, Deep River, Mon Désert, Moka, Cote d'Or, Roselyn Cottage, Chantenay, and on lands belonging to Mr. Madhoo and Société Langlois at Sébastopol.

Since the above measure has been taken, a voluntary cessation of the hand collection of adults has been followed on some other estates in the Island, viz: Britannia, Rose Belle, Riche Bois, Savannah, Mon Trésor and Mon Désert, Bel Air St. Félix, Mon Loisir G., Schœntfeld, Haute Rive and Union Estates. This season approximately 33% of the interested centres have thus ceased hand collection.

Concurrently with the above trials an experiment on the intensive collection of adults has been started during this campaign on one estate with a view to comparing the results of hand collection *versus* non-collection of adults. Results will be published as soon as available.

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After full consideration by the Phytalus Advisory Board, Proclamation No. 7 of 1931 regulating the transport of manure through the infested zones has been revoked. The above measure, as a control against the dissemination of this pest, has been found to be ineffective.

From August to December, 1936, the 2nd Phytalus Officer, Mr. P. Regnard was sent on mission in Madagascar for the collecting, breeding, and shipping, of a Tachinid fly (sp. not yet identified), known to parasitize the adult beetle *Enaria melanivora*, Kl. As a result of this mission 18,690 live flies have been received in Mauritius. These have been liberated on twenty different estates where there exists an adequate annual rainfall range and where the collection of adults had been given up.

A special report on this mission has been submitted by the 2nd Phytalus Officer and the Assistant Entomologist. At the time of writing no recovery of the flies in the field has been reported. The parasites introduced by the Phytalus Investigation Officer during his mission in the Far East in 1935-1936, as well as the progress of the work, has been fully considered in a special report submitted by this Officer.

2.—Major Pests Recorded During the Year.

SPOTTED BORER *Diatraea venosata*, Wlk.

Severe attacks of this pest were noticed during the year on some estates situated on the coastal belt of the North and South of the Island. A short survey was carried out at the end of the crop season with the following results: on a total of 7,300 canes examined from different localities the mean % of stalk infestation was 23.8; the maximum and minimum were 83% and 3% respectively. The mean joint infestation was 12.6%; the maximum was 28.5% and the minimum 5.6%. The intensity index was 2.3; the maximum 5.6 and the minimum 1.1. One of the leading varieties, B11.10/12, was very severely attacked. The joint infestation and the intensity index were decidedly higher than in White Tanna.

Some preliminary work has been done on the search for a local host which might eventually be used for the mass breeding of *Trichogramma australicum* Girault, and the rice moth, *Corcyra cephalonica* St., was found to meet requirements. The life cycle of this moth was worked out. During November-December the average life cycle from eggs to adults was 48 days. Several generations of *T. australicum* Girault, was successfully bred on the eggs of this moth; the parasite completed its cycle therein in 9 days. It was also found that with a lack of moisture the period of development in the various stages of *C. cephalonica* St. considerably increased.

The institution of a campaign against this pest, by means of introduced parasites, is under consideration.

THE BLACK ANT (*Technomyrmex detorquens* Wlk.).

This black ant, hitherto known as *Technomyrmex albipes* Smith, should now be called *detorquens* Wlk., as this name is anterior to *albipes*. Its biology has been partly studied in captivity. It has been found that the workers of this ant can be induced to lay eggs in captivity. Its complete life history has not yet been fully worked out. To control this ant in houses the use of poisoned syrup (Barber's formula) has generally given satisfactory results, though in some cases apparent failure has been reported. Banding

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grease to control this pest on medium-sized citrus and other orchard trees infested with the mealy bug *Icerya seychellarum* West. has been successfully and intensively used in the Island during the year.

THE COCONUT SCALE, (*Aspidiotus destructor* Sign.).

The introduction of the predator *Cryptognatha nodiceps* Mshl. has not yet been possible. Hopes to obtain this predator from Java were entertained, but unfortunately the introduction of this insect from Fiji to Java has not yet been successful. The Phytalus Investigation Officer on his return journey from the Far East imported into the Island two wasp parasites from Java, viz: *Spaniopterus crucifer* Gahan, and *Comperiella unifasciata*, Ishii. No indication of the establishment of these parasites has been reported yet. Through the kind co-operation of Dr. Van der Goot, of Java, a second consignment of these chalcid parasites were sent in self-feeding jars, but they were unfortunately received in bad condition.

Stomoxys nigra Macq.

Several searches were made to locate the breeding place of this fly in large numbers; no definite results have been obtained yet.

3.—Publications.

The following papers were published during the year by Officers of this Division:

1. Termites in Mauritius;
2. Les Coccinelles des Iles Mascareignes;
3. Sur un procédé peu connu pour la conservation des collections d'insectes dans les pays chauds.

4.—Miscellaneous.

No change in the lecturing duties at the Agricultural College occurred. Numerous visits to various estates and small planters were paid by officers of this Division and demonstrations and advice respecting the methods of control were duly given to those concerned.

The Scientific Assistant and the Chief Phytalus Officer (for a certain period) were detailed one day per week for the examination of plants, seeds, and fruits, at the Customs.

The 2nd Phytalus Officer was detailed for a mission to Madagascar during the period August to December, 1936.

ANDRÉ MOUTIA,
Assistant Entomologist.

CHEMICAL DIVISION.

(A) INVESTIGATION WORK.

1.—Mineral Content of Pastures.

The investigation concerning local pastures has been completed during the year under review, and all the data obtained will form the subject of a full report to be published as a departmental bulletin.

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The average figures are given below:

Type of soils	No. of samples	N	CaO	MgO	P ₂ O ₅	K ₂ O	Na ₂ O	Cl
Calcareous sandy ...	19	1.49	0.84	0.37	0.52	1.25	1.76	1.64
Red ...	11	1.23	0.49	0.40	0.51	1.55	1.33	0.70
Dark brown ...	14	1.94	0.73	0.38	0.45	1.71	1.55	1.31
Yellow ...	7	1.30	0.60	0.37	0.57	1.41	0.62	0.73
Grey ...	7	1.01	0.44	0.40	0.47	1.26	0.57	0.55
Marshy ...	2	0.90	0.35	0.45	0.55	2.51	0.64	1.10
British Cultivated pasture ...	24	2.83	1.00	—	0.74	3.18	0.25	0.95

As is seen, the local pastures, when compared with a British cultivated pasture, are deficient in practically all the minerals: the elements more deficient are nitrogen and potassium.

2.—Chlorine in Rain Water.

The amount of chlorine was determined in samples of rain water systematically collected during the years 1934, 1935, 1936, from different parts of the Island. This question has been fully dealt with in Leaflet 41 published by this Department. The average amounts of chlorine expressed in parts per million can be summarised in the following table:

Districts	Year	
	1934-35	1935-36
	(parts per million)	
Plaines Wilhems ...	14.36	18.72
Grand Port ...	15.35	17.59
Flacq ...	15.98	23.35
Moka ...	16.26	17.69
Port Louis ...	17.44	16.97
Rivière du Rempart ...	17.53	16.52
Pamplemousses ...	22.63	21.54
Savanne ...	29.43	24.91

The high figures obtained in Mauritius are to be attributed to sea spray blown over the Island.

3.—Soil.

(a) A soil investigation was undertaken in order to explain the excessive corrosion of power lines at Fort George; the sample of soils forwarded were found to contain a very high percentage of calcium carbonate with a small amount of calcium chloride and they were all in the alkaline range with an average pH of 7.8. On the other hand these soils belong to the open-textured type and as such have a low retentive power for water and are highly permeable to air as the rate of movement of the soil air is dependent on the aggregate volume of the interstitial spaces—the porosity of the soil has therefore a great influence on the diffusion of air. Soil air contains about 20% oxygen, which is the active agent in corrosion.

(b) Two soil investigations, from an agricultural point of view, were performed in the Southern district at the request of the managers of two sugar estates, and reports were duly submitted. The analytical data are given below:

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		A ₁	A ₂	A ₃	B ₁	B ₂
Nitrogen	...	0.17	0.22	0.22	0.28	0.34
Phosphoric Acid (Truog's)	...	0.002	0.003	0.003	0.001	0.002
Potassium (exchangeable)	...	0.01	0.062	0.014	0.007	0.012
PH	...	5.8	6.0	6.2	6.2	6.2
Carbon/Nitrogen	...	14.0	12.5	14.4	8.8	8.5

With the exception of A₁ all these soils have a low content of available potash which is characteristic of the type of soils found in this district ; the available phosphoric acid is also low. The C/N ratio shows that the A series are relatively more supplied with organic material than the B.

4.—Ensilage.

An experiment on ensilage was started on a small scale in order to get practical information as to the local application of this practice.

At the end of May a silo (10 ft. x 6 ft.) built at the Government Dairy was duly filled up with about 5½ tons of green grasses (mixed species) ; at the end of October the silo was opened and a sample was taken and analysed ; the figures obtained are given below :

Moisture	...	...	...	80.6
Volatile organic acids (calculated as acetic acid)	...	...	...	3.50
Non-volatile „ „ („ „ lactic „)	...	...	...	4.58
Amino acids („ crude proteins)	...	...	...	0.06
Volatile bases („ „)	...	...	...	0.09
Crude proteins	...	...	...	1.12
Ether extract	...	...	...	0.25
Nitrogen-free extractives	...	...	...	0.25
Crude fibre	...	...	...	5.73
Ash	...	...	...	1.29
True proteins	...	...	...	0.87
Carbohydrates	...	...	...	11.01

The information derived from above data may be summarised as follows :

- (a) 77.7% of the protein is in the form of true protein ;
- (b) The hydrolytic change affecting the true protein does not appear to have proceeded to a great extent during the ensilage ; as a source of digestible protein the sample is therefore of an inferior quality ;
- (c) The presence of the volatile and non-volatile organic acids shows that moulding of the silage had not occurred.

5.—Compost.

A series of experiments were performed by the Agricultural Division on composts made up of alternate layers of vegetable matter, soil, and ash, a thin layer of farmyard manure was also introduced to supply the decay organisms and to start the action.

The following chemical data were obtained.

	A	B	C	D	E
Moisture	47.2	62.5	64.0	64.0	66.5
Total Nitrogen	0.38	0.40	0.34	0.41	0.35
Fixed „	0.37	0.40	0.33	0.38	0.34
Phosphoric acid	0.46	0.32	0.28	0.27	0.02
Potassium oxide	0.34	0.22	0.33	0.30	0.13

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A and B were composed of grasses and dead leaves, C of cane trash, D of cane trash and diluted molasses, and E of mixed vegetable residues.

6.—Rotenone.

A sample of Derris root (*Derris elliptica*) grown locally was forwarded to this division for examination. The fibrous roots were ground in a powerful grinding machine, the fine powder obtained represented only 31% of the crude material. This powder was digested with carbon tetrachloride, the extract duly treated yielded fine white crystals which separated out when the temperature was lowered. A yield of 5% of rotenone was finally obtained.

7.—Determination of P_2O_5 in Guano Phosphaté.

A series of determinations of P_2O_5 in Guano Phosphaté was performed, using the volumetric method of Lorenz-Schaffer, in order to recommend this new method to the local agricultural chemists; it was clear by comparing the results obtained that great reliance could be placed upon this rapid method.

Moreover the preliminary chemical treatment, *i.e.* the destruction of the organic matter, has been particularly worked out in order to supersede the long and tedious ignition method; treatment with sulphuric acid and potassium chlorate was adopted. Analytical details of the method and its proper application to guano phosphaté has been published in the *Revue Agricole*.

8.—Milk.

The analysis of milk from the Government Dairy was carried out as usual during the year.

The following figures may be quoted:

		Specific Gravity	Total Solids %	Fat %
March	morning	... 1030.0	—	3.6
	evening	... 1028.6	13.12	4.1
	morning	... 1029.2	12.33	3.3
	evening	... 1029.0	12.76	4.3
	morning	... 1026.8	12.51	3.5
July	evening	... 1028.7	12.80	4.3
	morning	... 1029.9	11.80	3.6
	evening	... 1031.8	12.50	4.3
	morning	... 1030.3	11.20	3.3
	evening	... 1028.7	12.90	4.3
	morning	... 1028.7	11.90	3.6
October	morning	... 1030.2	12.09	3.5
	evening	... 1032.2	12.69	3.8
	morning	... 1030.1	12.91	1.6
	evening	... 1030.6	13.77	4.5
	morning	... 1030.6	12.63	3.6
	evening	... 1030.6	13.04	4.2
	morning	... 1030.1	12.42	3.8

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9.—Calorific Value of Bagasse.

Determinations of the calorific values of the samples of bagasse from the most promising seedling canes of the S.R.S. were started, unfortunately an accident occurred to the bomb calorimeter, which was returned to the makers, and this investigation had to be postponed.

(B) ROUTINE ANALYSES.

The routine work was less during the year under review than in the preceding year:

	Samples received	Estimations
Lime ...	2	3
Dipping ...	34	52
Phosphatic manure ...	19	29
Fumier ...	32	67
Miscellaneous ...	18	24

In addition to the above, and in connection with investigational work, the following determinations were performed:

	No. of Samples	Estimations
Soils ...	5	29
Water ...	17	34
Fodders ...	60	180
Silage ...	2	24
Aloe Fibre ...	1	2
Compost ...	5	30
Rotenone ...	8	8
Milk ...	13	39

(C) EDUCATION.

The usual duties in relation to the teaching of chemistry at the Mauritius College of Agriculture were performed by the Lecturer and Assistant Lecturer in chemistry.

(D) MISCELLANEOUS.

Mr. R. Mamet was transferred to the Entomological Division and put in charge of the parasites imported for the Phytalus campaign, during his absence Mr. R. Rivalland acted as Scientific Assistant; Mr. Mamet resumed his duty in the middle of March.

Mr. L. Fayd'herbe, who acted temporarily as Tobacco Analyst in the Chemical Division, left the Department at the end of October to take up a post under the Anglo Ceylon Co.

R. LINCOLN,
Chemist.

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TOBACCO DIVISION.

The work of the division was confined to trials with varieties of tobacco and selection plots at the Tobacco Station, La Ferme. The object of the trials was to obtain, if possible, a variety or varieties with a flavour more suitable for the export market, and with this object in view seed of new varieties was obtained from India and Canada.

Conditions generally at the Tobacco Station were unfavourable, the rainfall being scanty throughout the growing season and hot, dry winds prevalent. Hereunder is set forth the monthly rainfall for the past four years.

Month		1933	1934	1935	1936
—		ins.	ins.	ins.	ins.
January	...	3.48	7.88	10.63	8.35
February	...	5.86	.09	12.20	4.70
March	...	3.55	.40	3.82	1.00
April	...	2.03	.15	10.65	.71
May	...	.22	4.21	.57	.72
June	...	1.21	1.26	1.12	.53
July	...	.50	.16	.66	.16
August	...	.54	.58	.62	.06
September	...	1.00	.45	.54	.12
October	...	.56	.34	.75	6.98
November	...	—	5.66	6.85	.90
December	...	1.30	.76	4.64	6.96
Yearly Total	...	20.25	21.94	53.05	31.19

The tobacco was planted out during March and April and the growing season may, therefore, be said to be March to September.

It will be seen from the foregoing table that the rainfall during the months March–September, both inclusive, is the lowest ever recorded. Further, sufficient irrigation water was not available owing to the canals being too small to carry more than $\frac{1}{4}$ c. sec.

1.—Experiments.

The experiments were divided into four groups, viz:

- A. Flue-cured variety ;
- B. Air-cured variety trials ;
- C. Flue-cured selection plots ;
- D. New variety trials.

In addition to the above an area was set aside for the collection of seed of the varieties Amarello and Flanagan for distribution to planters during 1937.

A.—FLUE-CURED VARIETY TRIALS.

In this trial the three varieties Goldleaf, Adcock, and White Stemmed Orinoco, were compared in a Latin Square, each plot being approximately $\frac{1}{7}$ th acre. These varieties from the previous year's results, and from smoking tests, appeared to be superior to the variety Amarello, which is the principal variety grown by planters.

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The fertilizer treatment was equivalent to an application of 300 kilos of a fertilizer analysing 3N. 11.5P. 6K. and it was made up as follows:

		Plant Food. Kilos per Acre.		
		N.	P.	K.
Nicifos 11.....	50 ks.	9.	9.	—
Superphosphate 17%.....	150 „	—	25.5	—
Sulphate of Potash 48%.....	37.5	—	—	18
		9	34.5	18

The fertilizer was applied prior to planting, being distributed along the row the plants were to occupy. Planting was done at distances of 3 feet between the rows and 2½ feet within the rows.

Seed was sown on March 30th and planting was carried out on May 18th. The plants made good progress immediately after planting, but the prolonged drought, combined with insufficient irrigation, resulted in stunted growth and drought spot. White Stemmed Orinoco appeared to withstand the conditions better than the other varieties and was easily the earliest. The yield, however, was rather low. Adcock was better so far as yield and growth were concerned, but the leaf suffered severely from drought spot and did not ripen. Goldleaf, whilst being inferior to White Stemmed Orinoco, was superior to Adcock, although the leaf did not ripen well and suffered from drought spot.

Conditions were such as to render the comparative results obtained valueless.

B.—AIR-CURED VARIETY TRIALS.

For this trial three new varieties were utilised, viz.: Greenwood, Improved Clarksville, and Maryland. The first two having been received from Uganda and the last named from Réunion. They were grown with the aid of a complete fertilizer analysing 10. 10.20 N.P.K. applied at the rate of 200 kilos per acre.

Seed was sown on the 8th April and planting of Greenwood and Improved Clarksville was done on the 27th April. In the case of Maryland no plants were obtained from the first sowing, therefore a further sowing was effected on April 27th and planting took place on June 1st.

Early growth was disappointing, being slow and irregular. The drought caused the plants to commence flowering when still small and the leaf did not ripen properly, false ripening and drought spot being prevalent. The yield and quality of the cured product was very low, the majority of the leaf remaining green.

C.—FLUE-CURED SELECTION PLOTS.

During the previous year the seed from specially selected plants was kept and utilised for special selection work during the year under review. The varieties utilised were:

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Adcock: plants Nos. 1, 2, 20, 21, 22 ;

Cash: plants Nos. 1, 2, 4, 6 ;

Goldleaf: plants Nos. 2, 3, 7, 9, 25 ;

Hickory Pryor (R): plants Nos. 17, 18, 23, 27, 31 ;

White Stemmed Orinoco (N): plants Nos. 2, 9, 10, 12, 13 ;

White Stemmed Orinoco (R): plants Nos. 1, 11, 12, 23, 24 ;

Warne (N): plants Nos. 1, 2, 5, 6, 7.

The progeny plots were duplicated, one plot receiving an application of fertilizer equivalent to 300 kilos per acre of a 3. 10.6 (N.P.K.) mixture, whilst the other received an application equivalent to 300 kilos per acre of a 2.10.6. (N.P.K.) mixture. The distance of planting was 3 feet by 2½ feet.

Seed was sown during April and planting was carried out early in June. In all plots the plants suffered from the unfavourable conditions. There were, however, differences to be recorded between progeny plots which in certain cases was most marked. Whether these differences were due to inherited characteristics, or the unfavourable conditions, which probably accentuated them in certain instances, it is difficult to say. There was no difference between the two fertilizer treatments, although the drought, no doubt, affected this factor. In all cases the leaf was poor, drought spot and false ripening being prevalent.

Seed was saved from the best plants in each progeny plot and further selection will be continued during the coming year.

D.—NEW VARIETY TRIALS.

The following new varieties were received from India and Canada, and were grown for the first time during the past year:

From Pusa Research Institute, India—

Adcock ;

Harrison's Special ;

Pusa Hybrid 142 ;

Pusa Hybrid 177.

From Harrow, Ontario, Canada—

White Mammoth 61 ;

Yellow Mammoth 58 ;

Virginia Bright ;

Bonanza 47 ;

Jamaica Wrapper.

They were planted in single plots under a fertilizer treatment of 3.10.6. N.P.K. applied at a rate of 300 kilos per acre.

The seed was sown early in May and planting took place in mid-June. Despite the unfavourable conditions all the varieties, with the exception of Adcock, did better than other varieties at the Station. Early growth was fairly good and maintained throughout the season. From a growth point of view the most promising were Harrison's Special, Bonanza, and the two Pusa Hybrids. All, however, ripened fairly well, false ripening and drought spot was not so prevalent as in other plots.

In curing, Bonanza and Harrison's Special were the best. They yellowed well in the barn and would have given a fairly high percentage of bright leaf had it been possible to cure them alone. With the exception of Adcock the other varieties are fairly promising.

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Seed was saved from the best six plants and kept separate. This will be utilised for progeny plots during the ensuing year when further selection will be made.

Smoking tests have been carried out with the cured leaf from these varieties with the following results, and from which it will be seen that the Canadian varieties appear to be superior in so far as flavour is concerned, to the Indian varieties.

2.—Result of Smoking Tests.

White Mammoth (L.M.F. 1)—

No tang, neutral flavour, cool, burns well, very light ash.

Yellow Mammoth—

No tang, neutral flavour, mild, burns well, very light ash.

Virginia Bright—

Very slight tang hardly noticeable, rather hot, burns well, very light ash.

Jamaica Wrapper—

Slight tang, fairly cool, burns well, light ash.

Bonanza—

Slight tang, otherwise neutral flavour, rather hot, burns well.

Pusa Hybrid 142 (L.M.F. 1)—

Slight earthy tang, burns well, light grey ash, cool.

Adcock—

Earthy tang, rather sweet, burns well, cool, light ash.

Harrison's Special—

Earthy tang, burns well, rather hot, light ash.

Pusa Hybrid 177—

Definite tang, burns well, hot, dark ash.

3.—Seed Selection.

An area of the station was devoted to the varieties Amarello 8.5.2. and Flanagan, which were grown for the express purpose of obtaining seed for distribution to planters. These two varieties are the ones grown by both flue-curers and air-curers and, whilst the varieties are satisfactory in so far as yield and colour are concerned, their flavour precludes any possibility of ever obtaining an export market.

The two varieties were planted during July under a fertilizer treatment of 400 kilos per acre of 10.10.20. N.P.K. mixture. The early growth was good and was maintained and a quantity of seed has been obtained for distribution to planters during the ensuing year.

4.—General.

A windbreak of Eucalyptus has been planted behind the nurseries and, in a few years, this should serve to shelter the station from the prevailing winds. In addition, hedges of "Bread and Cheese" (*Pithecolobium unguis-cati*), have also been planted all round the Station.

The stoning of the fields and nurseries was completed during the year and the station considerably improved thereby.

In order to allow of a greater area being available for experiments the station, which was originally laid out in three fields, was altered to comprise but two fields. Thus each field gets but one year's rest from tobacco.

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The irrigation canals required considerable repair during the year and really required reconstruction. This is the subject of a separate report.

With regard to buildings apart from the flue-curing barns which have been kept in a good state of repair, the other buildings require considerable repairs owing to the depredations of white ants.

The report on the Tobacco Industry in general is issued by the Tobacco Board, and figures relative to acreage, production, and consumption, are included therein, also full report as to conditions prevailing in the various districts, diseases, etc.

GEOFFREY CORBETT,

Government Tobacco Officer.

GOVERNMENT DAIRY.

1.—Yield of Milk.

94,606 litres of milk were produced during the year, as against 92,339 in 1935. The milk was disposed of as follows:

	1936	1935
Supplied to Government Hospitals ...	18,955	12,893
Supplied to the Public ...	70,290	75,619
Fed to calves...	4,932	3,478
Samples for control ...	429	349

The price of milk was raised from 22 cents to 25 cents a litre as from the 1st of April, 1936. As a result of such increase the amount of milk purchased by the public diminished slightly while the number of customers remained constant. This would indicate conclusively that the dairy milk fulfils a definite requirement which is not to be met from other sources.

2.—Births.

34 births were recorded: 15 males and 19 females.

3.—Deaths.

One cow died during the year from rupture of the spleen as the result of an accident.

4.—Sales.

21 calves were sold to breeders; 3 cows were discarded as unfit for reproduction and sold to the butcher.

5.—Abortion.

Four cases of abortion were recorded, as against 12 in the previous year.

6.—Health Condition.

Blood tests for the detection of trypanosomiasis were carried out regularly during the year with negative results. It is gratifying to record the general improvement in the health condition of the dairy herd whereby the number of cases of retention of afterbirth fell from 21 in 1934, and 9 in 1935, to 3 in 1936.

7.—General Remarks.

The usual tests were applied to the milk during the year, viz: chemical tests by the Chemist of the Agricultural Department and bacteriological tests by the Bacteriological Laboratory. Results were satisfactory in each case.

Moreover, tuberculin tests showed that the herd continued to be free from Tuberculosis.

MAURITIUS GOVERNMENT DAIRY

Balance Sheets as at 31st December, 1935, and 31st December, 1936.

PROFIT AND LOSS ACCOUNT FOR THE YEARS ENDING 31ST DECEMBER, 1935, AND 31ST DECEMBER, 1936.

Y. LEFEBURE,
Officer-in-Charge.

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RODRIGUES.

1.—Climatic Conditions—Rainfall.

MONTHS	OYSTER BAY		SOLITUDE		LA FERME	
	Inches	Rainy days	Inches	Rainy days	Inches	Rainy days
January ...	3.25	13	4.17	17	3.23	15
February ...	8.62	13	8.89	14	5.02	9
March ...	8.91	17	8.95	16	7.27	13
April ...	2.87	10	2.52	15	3.02	11
May ...	3.74	15	4.26	17	2.37	13
June ...	2.18	16	2.35	20	1.29	14
July ...	2.26	18	2.43	22	2.03	19
August ...	3.29	16	4.03	19	3.30	12
September ...	2.39	13	2.62	16	1.76	13
October ...	5.51	10	6.13	13	4.69	5
November ...	1.93	14	1.87	15	1.74	6
December ...	2.71	8	2.70	9	4.97	5
Total ...	47.66	163	50.92	193	40.69	135

Highest rainfall in one day :

Oyster Bay On the 2nd February : 2.39 inches

Solitude On the 29th March : 2.57 „

La Ferme On the 18th December: 2.42 „

2.—General Conditions.

A cyclone passed at a certain distance from the Island in February. Wind velocities were not very high and of but short duration. No damage was done to plantations.

The weather conditions throughout the year have been on the whole suitable for the growth of all food crops, except for beans, which gave a poor yield owing to lack of sufficient rainfall during the germination and development of the crop. However, farmers found some compensation in prices which have been maintained at a higher rate than last year.

The tobacco crop has been, on an average, of better quality than has hitherto been produced and good prices were obtained generally. It is pleasing to note the increased interest now being taken in the growing of the Virginian type of tobacco. The total acreage for this year has exceeded that of last year and another increase is expected for 1937 as a greater number of applications for seeds has been received since November. Not only are growers of the past season increasing their acreage, but some cultivators of the eastern localities, that had given up the cultivation of tobacco for several years, have also applied for seeds.

Another feature showing the progress of the industry is the fact of one of the growers of La Ferme building a barn for the production of flue-cured tobacco. "Rodrigues tobacco" was cultivated by some farmers for local consumption.

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More attention was given to the growing of vegetables. There is some prospect of an extension of cultivation, provided demand from the K.P.M. steamers is steadily maintained.

A good crop of Acacia seed was obtained and the prices offered were fairly satisfactory.

3.—Live Stock.

The industry is maintaining its progress. Exportations of cattle, goats, and sheep have increased. With regard to pigs, the small deficiency in quantity was largely compensated by the quality of the produce; high grade type of animals have been exported.

Fine specimens of poultry were also obtained, and the export has considerably increased.

Breeders in greater number availed themselves of the opportunities afforded by Government for the improvement of their stock. Some progress is noticeable with regard to interest taken in milk production.

4.—Animal and Plant Diseases.

No disease of any great economic importance was recorded throughout the year.

5.—Experimental Station and Stock Farm.

The Agricultural Superintendent's quarters were partly repaired. The kitchen was rebuilt and a masonry drain was built alongside the house. The Overseer's quarters and the huts of the night watchman and the boatman have been thoroughly repaired. A water reservoir was built in the new orchard which has been extended.

A new sheep pen was built and necessary repairs were carried out to the poultry run and pig sties. The roads and drains were maintained in good conditions.

Experiments were continued with different varieties of food crops and planting material of promising varieties were distributed.

Maize.—Chlorosis was more prevalent on the South African variety introduced in 1935.

Sweet Potatoes.—A new variety, "Key West", was introduced and is under test.

Vegetables.—Have done fairly well and found a ready market.

Rhodes Grass.—Was introduced and is thriving fairly well.

Tobacco.—Considerable attention was again devoted to tobacco experimental work. Control methods adopted for preventing diseases and insect pests have proved effective.

Vanilla.—Satisfactory results were obtained.

Coconuts.—The plantation at Baie du Nord was badly damaged by goats. The other plantations have been progressing. An area of about one acre is being cleared at Oyster Bay for planting of selected fruits.

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Fruit Trees.—Special attention was devoted to the propagation of fruit trees. New varieties of oranges, grape fruit, mandarin, and lime were imported. Budding of these varieties on local citrus that are resistant to gumming disease was carried out as soon as scions could be obtained. Intensive planting of local citrus to be used as stock was also carried out.

The Litchi and bread fruit trees, introduced some years ago, having now reached sufficient development, it has been possible to obtain from them planting material for propagation.

Progressive work has been accomplished during the year at the Stock Farm. The various pure-bred cattle, pigs, and sheep, kept at the Stock Farm for breeding purposes, have greatly helped the breeders to acquire a better class of animals.

One large black boar was imported from South Africa and, as marked progress is already recorded in relation to pig raising, this action can only give but most satisfactory results.

Arrangements have been made for the introduction of an Afrikaner bull which is expected early in January, 1937.

Two Black Head Persian rams were also imported, but unfortunately they died in September from congestion of the lungs. However, a number of ewes belonging to several breeders had already been served and the progeny are fine specimens that will, in due course, assist in improving the breed.

Leave.—The Overseer was granted leave from 24th of July to 6th of November. The Stock man was granted two months leave from the 29th of November.

6.—Agricultural Education and Demonstration.

An intensive educational campaign has been pursued during the year, advice and assistance being given whenever required. Persistent efforts were made to induce farmers to improve their cultural methods, and the benefit to be derived from such policy has been demonstrated by the carrying out of several agricultural improvements (building of drains and walls and planting of "vetivert grass" to combat soil erosion, and manuring) in certain localities on the planters own lands. This system has borne good results and justify further demonstrations. Steps have been taken for a continuation during a certain number of years in order to remove from the farmers' minds the erroneous idea that the improved methods of cultivation advised to them are very costly ones and far above their means. A few cultivators have already followed the example set to them.

Tobacco growers have been given every opportunity of watching the methods employed at La Ferme Demonstration plot in cultivating, curing, and grading tobacco. This action has had good effect and progress is noticeable except with regard to grading, which is still in need of improvement.

School gardens.—Steps are being taken to have the school gardens of Lataniers and La Ferme operating on the same lines as those of Mauritius, and as these gardens are rather small, to have them enlarged in order to grow a greater collection of crops.

7.—Improvement of Pasture.

The experiment carried out in relation to the improvement of pasture in the Cattle Walk (shade trees provided and good varieties of grass planted

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in the interlines) has given most encouraging results. The work, if carried out on a larger scale during a certain number of years, would certainly result in a marked improvement of the conditions of the Cattle Walk, leading to an increased development of the livestock industry.

8.—Examination of Imported Plants.

Imported plants, fruits, etc., have been regularly examined and consignments destroyed whenever necessary. A new regulation relative to the introduction of plants, etc., is under consideration with a view to affording a greater protection against the introduction of pests and diseases.

9.—Irrigation.

A site for the construction of a dam that could store sufficient water for irrigation purposes has been selected at La Ferme. The survey work is in progress and will be completed soon.

10.—Visits.

The Honourable Director of Agriculture, together with the Senior Agricultural Officer, visited the Island in August, and the Veterinary Officer in September. Discussions have covered a wide range of subjects and a foundation for a sound agricultural policy was agreed upon.

11.—Exports.

			1936	1935
Acacia seeds	...	...	10,097 bags	10,764 bags
Beans	...	...	516 "	650 "
Maize	...	...	1,080 "	3,036 "
Garlic	...	...	319 "	489 "
Onion	...	...	54 "	48 "
Ginger	...	...	1 "	—
Peas	...	...	2 "	7 "
Tobacco	...	...	140 bales	106 bales
Hides	...	...	9 "	3 "
Vanilla	...	...	1 tin	—
Chillies	...	...	6 cases	—
Beeswax	...	...	1 "	—
Cattle	...	...	448 heads	366 heads
Goats	...	...	2,898 "	3,359 "
Goats and Sheep	...	...	2,462 "	1,380 "
Pigs	...	...	2,046 "	2,097 "
Donkeys	...	...	8 "	—
Dogs	...	...	5 "	4 "
Fowls including ducks and guinea fowls	...	...	30,991 "	21,301 "
Turkeys	...	...	314 "	283 "
Timber	...	...	134 pieces	75 pieces

RENÉ JAUFFRET,
Agricultural Superintendent.

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PART III.

1.—Staff Movements.

Mr. M. M. Burrenchobay, Assistant Registrar Co-operative Credit Societies, who had been granted study and vacation leave to be spent in Ceylon and India respectively, returned to Mauritius and resumed duty on the 31st March, 1936.

Mr. L. Baissac, Sugar Technologist, proceeded to Europe on leave of absence on the 18th March, 1936. During his absence Mr. R. Avice, Assistant Sugar Technologist, acted as Sugar Technologist. Mr. L. Baissac returned from leave and resumed duty on the 20th November, 1936.

Mr. G. Orian, Scientific Assistant, was granted three months' vacation leave of absence from 1st April to 30th June, 1936.

Mr. G. Mazery, Scientific Assistant, Sugarcane Research Station, left for Europe on leave of absence on the 12th April, 1936. Mr. P. Tenant replaced Mr. G. Mazery as from the 20th December, 1936.

Mr. I. Félix, 2nd Grade Clerk, left for Europe on leave of absence on the 27th April, 1936. He returned to Mauritius and resumed duty on the 31st December, 1936.

Dr. F. E. Lionnet, Veterinary Officer, left Mauritius on special mission to the Agaléga Islands on the 11th May and returned to the colony on the 30th May 1936. During his absence Mr. Y. Lefébure, Stock Inspector, acted as Veterinary Officer.

Mr. N. Craig, Bio-Chemist, Sugarcane Research Station, proceeded to Europe on leave of absence on the 9th June, 1936.

Mr. J. Duhamel, Plant Inspector, left for Madagascar on leave of absence on the 3rd July, 1936. He returned to Mauritius and resumed duty on the 31st December, 1936.

Honourable G. E. Bodkin, Director of Agriculture, and Mr. C. A. O'Connor Senior Agricultural Officer, left on an inspection visit to Rodrigues on the 9th August, 1936, and returned to Mauritius on the 24th August, 1936.

Dr. F. E. Lionnet, Veterinary Officer, proceeded on an inspection visit to Rodrigues on the 7th September and returned to Mauritius on the 28th September, 1936. During his absence Mr. Y. Lefébure, Stock Inspector, acted as Veterinary Officer.

Mr. P. Régnard, Second Phytalus Officer, proceeded on an official mission on the 2nd August, 1936, to Madagascar in search of Phytalus parasites and returned to Mauritius on the 18th December, 1936.

Mr. M. Valaythen, Overseer, was granted three months' vacation leave prior to retirement from the service from the 1st September to the 30th November, 1936.

Mr. J. F. Frédéric was appointed Overseer, Richelieu Allotments, as from the 8th June, 1936.

Mr. S. Oree, Overseer, Experimental Station, Rodrigues, was granted three months' leave of absence, to be spent in Mauritius. He resumed duty on the 7th August, 1936.

DEPARTMENT OF AGRICULTURE

2.—Stations.

The headquarters, offices, and laboratories of the Department of Agriculture are located at Réduit, some 1,000 feet above sea level. The following principal areas of land are utilised and controlled by the Department for experimental field work in all its various phases: Réduit, 34.86 arpents; Barkly (altitude 700 feet) 13.7 arpents; Mon Plaisir, Pamplémousses, (altitude 220 feet) 9.62 arpents; La Ferme (altitude 420 feet) 12.82 arpents. A number of minor areas in different parts of the Island are leased or occupied rent free for experimental work, principally in connection with sugar and tobacco. The local "arpent" is slightly greater than the English acre.

3.—Revenue and Expenditure.

REVENUE.

Department of Agriculture.

	Rs.	c.
Sale of Plants	2,475.40	
„ „ Sugarcane	5,030.20	
„ „ Tobacco leaf	2,613.44	
„ „ Pine apple and Pineapple suckers	357.19	
„ „ B.C.G. Vaccine	1,161.00	
„ „ Dairy produce to the Public and Govt. Hospitals ...	24,868.00	
„ „ Pois Mascate	146.88	
„ „ Litchi crop	398.23	
Analytical fees	360.25	
Miscellaneous	393.56	
Contribution from Co-operative Credit Societies	750.00	
Contribution from Agricultural College Funds towards cost of Sugarcane Research Station	18,000.00	
Contribution from Agricultural College Funds towards salaries and allowances of Officers of the Department of Agriculture	23,450.00	
Contribution from Agricultural College Funds towards pension of lecturers at the Agricultural College	6,210.00	
Contribution from Sugar Industry Reserve Fund towards cost of the Sugarcane Research Station	14,000.00	
Special cess on sugar exports for Phytalus destruction (Ordinance No. 38 of 1933)	83,758.22	
Total	Rs. 183,972.37	

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EXPENDITURE.

				Rs.	c.
Personal Emoluments	...	...	...	234,869.36	
Maintenance of Gardens	...	...	...	6,815.91	
Prevention of Plant Pests and Diseases	...	...	...	1,248.53	
Prevention of Animal Diseases	...	...	...	780.67	
Upkeep of Stock	...	...	...	1,682.86	
Maintenance of Experiment Stations	...	...	...	17,461.14	
Apparatus, Chemicals and Laboratory Supplies	...	...	...	2,809.46	
Nursery	...	...	...	2,862.23	
Destruction of Phytalus	...	...	...	43,635.20	
Upkeep of La Ferme Tobacco Experiment Station	...	...	...	4,952.18	
Telephone	...	...	...	443.73	
Travelling	...	...	...	13,277.65	
Railway Services	...	...	...	2,179.99	
Passages	...	...	...	6,601.13	
Incidentals	...	...	...	807.78	
Government Dairy	...	...	...	25,385.72	
Grant for the purchase of a bull	...	...	...	550.00	
Representation of Colony at Conferences abroad	...	...	...	137.67	
Study leave of Assistant Registrar, C.C. Societies	...	...	...	548.00	
<i>Sugarcane Research Station.</i>					
Laboratory Equipment	...	...	...	2,914.87	
Labour and Field Equipment	...	...	...	9,551.45	
Travelling and Railway Services	...	...	...	2,030.57	
Incidentals	...	...	...	393.99	
Total	...	...	...	Rs.	381,940.09

The receipts and expenditure shown above are in respect of the calendar year 1936. The official financial year in Mauritius runs from July 1st in one year to June 30th in the following year. The pound sterling is equivalent at present to Rs. 13.33.

4.—Legislation.

The following Ordinances, Proclamations, and Notifications, were issued during the year:

Proclamation No. 10 of 1936.—Prohibiting the importation of certain articles into Mauritius.

Proclamation No. 24 of 1936.—Declaring certain insects to be beneficial insects.

Proclamation No. 36 of 1936.—To remit stamp duties and registration fees chargeable on instruments executed by or on behalf of the " St. Julien Co-operative Credit Society ".

Proclamation No. 43 of 1936.—To remit stamp duties and registration fees chargeable on instruments executed by or on behalf of the Rivièrè du Rempart Co-operative Credit Society ".

Proclamation No. 44 of 1936.—To remit stamp duties and registration fees chargeable on instruments executed by or on behalf of the " The New Eastern Bon Accueil Co-operative Credit Society ".

DEPARTMENT OF AGRICULTURE

5.—Board of Agriculture.

The Board of Agriculture established under Ordinance 30 of 1912 consisted of:

His Excellency the Governor, President.

The Director of Agriculture, Vice-President.

The following members were appointed for 1936:

The Honourable M. Martin, C.B.E.	Mr. Pierre de Sornay, <i>Ch. Leg. Hon.</i>
„ „ P. Montocchio	„ F. A. Nichols
„ „ R. Gujadhur	„ H. Lincoln
„ „ Tristan Mallac	„ G. Antelme
„ „ J. Léclezio, C.B.E.	„ G. Clarenc
„ „ Pierre Hugnin	„ H. C. Ducray
Captain H. G. Hitchcock, O.B.E.	„ Louis Larcher
Mr. R. M. Monk	„ J. de Spéville
„ Pandit M. Boleram.	„ L. H. de Froberville.

6.—Publications.

The following departmental publications were issued during the year:

BULLETINS.

- (a) Guide to the operation of Co-operative Credit Societies in Mauritius.
- (b) Sugarcane Research Bulletin No. 10. Some data on the effect of a late heavy dressing of Nitrogenous Fertilizer on the growth and metabolism of Sugarcane in Mauritius.

LEAFLET.

A new Disease of Tobacco, possibly of the Virus type.

REPORTS.

- (a) Annual Report of the Department of Agriculture for 1935.
- (b) Report on the working of the Co-operative Credit Societies for the year ending 30th June, 1936.
- (c) Report on the College of Agriculture for 1935.
- (d) Sixth Annual Report on the Sugarcane Research Station for 1935.
- (e) Final Compilation of Sugar Production for the 1935 sugar crop.
- (f) Revised Forecast of the 1936-37 sugar crop.
- (g) Preliminary Compilation of Sugar Production for the 1936-37 campaign.
- (h) Summary of Legislation affecting the introduction of plants, etc., in Mauritius.

The following articles from Officers of this Department were published in the *Revue Agricole*:

- 1. Les sols arrivés à maturité des localités à faibles pluviosités de Maurice by N. Craig, M.Sc.
- 2. La Polarisation du Sucre Roux by R. Avice, A.R.T.C.

ANNUAL REPORT OF THE

3. Essais comparatifs de variétés faits en 1935 par la Station de Recherches by A. G. Hill, B.A., B. Agr., A.R.C.Sc.
4. Les Coccinelles des Iles Mascareignes by Jean Vinson.
5. The Development of Biological Control of Insect Pests, with special reference to some current experiments by W. F. Jepson.
6. L'application du controle de la cuite aux appareils à cuire dans le vide par la méthode de la conductibilité électrique by L. Baissac and V. Olivier.
7. La fonction des différents types de racines de la Canne à Sucre by H. Evans, Ph.D.
8. La délécation du jus de la Canne P.O.J.2878 by L. Baissac.
9. Renseignements recueillis sur l'emploi des engrais et amendements autour du troisième Congrès International de la Science du Sol by P. Halais.
10. On a further use of the working mean in Statistical Analysis by A. de Sornay, I.A.C.
11. La faculté d'adaptation des Systèmes Radiculaires dans ses différents rapports avec le milieu extérieur by H. Evans, Ph.D.
12. Quelques suggestions relatives à l'application judicieuses des engrais by H. Evans, Ph.D.
13. Polarisation du Sucre Roux by R. Avice, A.R.T.C.
14. L'emploi de l'échantillonneur de jus de Java dans sélection des Seedlings de Canne by A. de Sornay, I.A.C.
15. Variations du taux de mélasse % canne by R. Avice, A.R.T.C.
16. Note sur les Cochonilles de l'Île d'Agaléga by Raymond Mamet.
17. Les sols arrivés à maturité des districts de Maurice où la pluviométrie est modérée by N. Craig, M.Sc.
18. Alimentation des moulins by R. Avice, A.R.T.C.
19. La transpiration et l'absorption de l'eau de la canne à sucre by H. Evans, Ph.D.
20. Essai expérimental sur les méthodes d'application d'engrais by H. Evans, Ph.D.
21. Dosage de l'Acide Phosphorique dans les guanos phosphatés by R. Lincoln, M.A.
22. Répartition du P_2O_5 " assimilable " par l'extraction du Carbonate de Potassium en fonction du P_2O_5 total et de la réaction des sols by P. Halais.
23. Le temps et la coupe by M. Koenig.

7.—General.

The Director of Agriculture served as a member of the Council of Government. He acted as Chairman of the Agricultural College Board, the Phytalus Advisory Committee, the Tobacco Board, the Allotments' Organisation Committee, and the Research Advisory Committee of the Sugarcane Research Station. He also served on the following Boards and Committees: The Board of the Mauritius Institute, the Forest Board, the Customs Tariff Advisory Board, The Mauritius Hemp Producers' Syndicate (Executive Committee), The Stock Breeders' Association, the Finance Committee of the Council of Government, and the Fisheries Permanent Advisory Committee.

APPENDIX

MEAN MONTHLY RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT THE STATIONS UNDER THE CONTROL OF THE DEPARTMENT OF AGRICULTURE

Stations	Central Experiment Station, Réduit						Botanical Gardens, Curepipe				Barkly Nursery, Beau Bassin				Abercrombie Nursery, Port Louis				Royal Botanical Gardens, Pamphle-mousses					
	Air temperature		Rainfall		Sunshine		Air temperature		Rainfall		Air temperature		Rainfall		Air temperature		Rainfall		Rainfall					
Elements :	Min. °C	Max. °C	Mean °C	% Relative Humidity	Depth of rain mm.	No. of days	Registered sun-shine Hours	% of possible	Min. °C	Max. °C	% Relative Humidity	Depth of rain mm.	No. of days	Min. °C	Max. °C	% Relative Humidity	Depth of rain mm.	No. of days	Min. °C	Max. °C	% Relative Humidity	Depth of rain mm.	No. of days	
Months 1936																								
January	21.5	28.2	24.3	71.6	282.3	28	248.6	61.0	18.6	26.5	84.2	384.0	31	21.7	30.2	73.3	237.4	22	23.4	31.6	66.4	262.1	18	
February	21.7	28.3	24.6	68.2	159.7	24	259.4	70.3	20.1	26.6	84.9	234.0	29	22.2	30.5	72.7	141.5	17	23.6	31.7	66.0	140.8	13	
March	21.7	27.7	24.2	71.0	117.4	28	251.0	66.5	19.4	26.0	89.3	309.8	31	23.0	30.3	68.3	36.0	14	23.6	31.3	62.8	85.2	14	
April	19.8	26.1	22.4	69.1	46.0	24	241.4	69.4	18.6	24.9	92.0	179.3	30	22.1	30.1	68.6	179.3	30	22.1	30.1	68.6	29.6	8	
May	16.7	24.1	20.1	70.7	61.2	27	238.8	69.2	15.4	22.2	86.0	231.5	29	20.2	27.2	70.8	36.8	17	20.3	28.5	65.6	43.0	11	
June	15.9	21.7	18.5	70.5	71.8	26	220.7	67.5	14.1	19.8	86.3	366.5	29	16.4	24.8	76.5	50.7	16	19.8	26.0	59.4	31.0	15	
July	15.5	20.8	17.7	73.6	48.2	27	206.9	60.7	13.4	19.3	88.3	222.0	31	15.4	23.0	73.7	18.6	24	18.8	25.3	61.0	17.6	14	
August	13.0	21.6	17.0	66.1	21.6	22	225.5	63.8	11.5	20.4	77.3	118.3	30	14.8	24.0	73.0	11.4	12	15.2	26.1	54.0	7.1	6	
September	14.9	22.5	18.3	65.9	49.0	24	246.9	68.9	13.2	21.5	83.1	237.2	28	16.0	24.7	73.1	16.8	13	18.0	27.5	54.0	13.1	7	
October	17.2	25.1	20.6	64.7	112.1	21	238.6	61.6	15.9	22.9	79.0	242.0	31	18.3	26.3	70.6	172.7	7	20.3	29.3	55.9	72.0	10	
November	19.2	26.3	22.4	65.3	41.8	18	259.4	66.4	17.8	24.5	80.5	292.0	30	20.1	28.4	65.9	29.0	10	21.9	30.2	57.8	44.9	14	
December	20.3	27.2	23.3	69.2	283.5	30	211.9	51.5	18.3	25.8	83.5	498.7	30	20.3	29.6	68.9	267.4	20	23.3	32.1	60.6	246.5	20	
Means	18.1	25.0	21.1	68.8	1294.6	299	2849.1	64.7	16.4	23.4	84.5	3245.3	359	19.2	27.4	71.3	1049.8	183	20.8	29.2	60.5	992.9	150	
	Totals		Totals		Totals		Totals		Totals		Totals		Totals		Totals		Totals		Totals		Totals		Totals	
	1451.9		1451.9		1451.9		1451.9		1451.9		1451.9		1451.9		1451.9		1451.9		1451.9		1451.9		1451.9	

REMARKS.—The figures for relative humidity are the means of readings at 9h and 15h. Temperature figures, at Réduit, are obtained from hourly measurements of thermograms standardised daily at 9h and 15h. At other stations, maximum and minimum thermometers are read daily at 9h and 15h. Rainfall is measured at 9h and the amount entered for the day.

229/6/37. Agri.—725.

